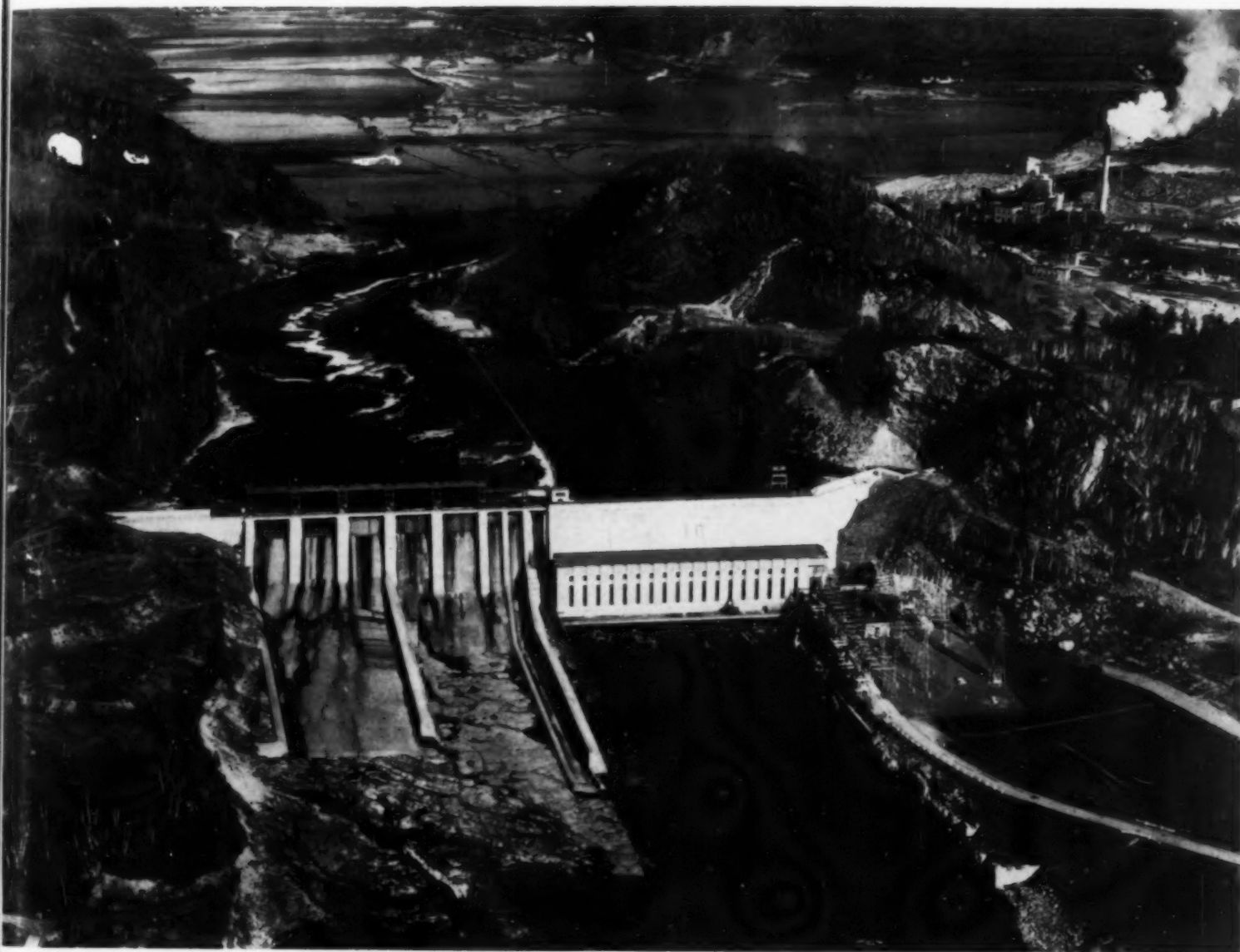


G CANADIAN GEOGRAPHICAL JOURNAL

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JUN 17 1957

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WATER POWER IN QUEBEC

KNOB LAKE ON CANADA'S NEW FRONTIER

GUATEMALA—PEARL OF CENTRAL AMERICA

TRAINING PARK WARDENS IN THE ROCKY MOUNTAINS



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OTTAWA, CANADA



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Photographic Surveys (Quebec Limited) photo

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Topography and climate created conditions which enabled Quebec to become a world leader in the production of hydro-electric power. The St. Lawrence and the turbulent rivers of the Laurentians and Appalachians have been harnessed to provide the Province of Quebec with more horsepower per capita than any country.



Quebec Water Power

by B. J. McGUIRE

ELECTRICAL energy is universally conceded to be the most versatile and valuable supplement to human energy yet devised. The impact of abundant and inexpensive electricity on our civilization is evident in the tremendous industrial expansion and the improvement in the economic well-being of citizens which have accompanied the development of hydro-electric power.

Against this background, the situation of the Province of Quebec in relation to hydro-electrical energy is unique. Quebec possesses more installed capacity *per capita* than any country in the world. In the next five years, the province will be adding installed hydro-electric capacity at a rate of almost 1,000,000 horsepower a year. The average cost of electricity in Quebec is among the lowest in the world, and her commercial potential is more than 300 per cent greater than her developed capacity.

Quebec's claim to pre-eminence in hydro-electric power is soundly based. She has approximately 8,000,000 installed horsepower capacity, with commercial potential of 26,000,000 horsepower. The average price of 4.5 mills per kilowatt hour in Quebec is approximately the same as the prevailing price in Norway and less than one-third the average cost in the United States.

The development of hydro-electric power on the scale achieved in Quebec requires the reconciliation and co-ordination of several factors. Essentially, topography and seasonal distribution of precipitation are the prime factors which determine the potential hydro-electric power of any region. Since it is only the run-off from this precipitation that is usable, its seasonal characteristics and storage possibilities are essential elements in firm power potential. Heavy capital expenditures are also involved. As a consequence, there must be a sound economic relation between the development of firm power and market requirements.

To assess and determine this relationship, appropriate consideration must be given to the problem of peak loads and the ever-changing pattern of consumer demands. It is in this area that the essential difference between the problems of the privately developed industrial enterprise and the public hydro-electric utility becomes evident. The former has a better opportunity to assess and adjust to predictable loads. The latter, supplying a multiplicity of demands from municipal utilities, dispersed industry and domestic requirements in an era of rapid expansion, has acute problems in assessing predictable loads.

The climate itself poses further problems that may result in service interruptions. This problem is shared equally by privately and publicly owned power companies. In these circumstances flexibility becomes essential in the over-all transmission and distribution pattern.

These problems of regulated flow, firm power in terms of market demand, the variation of load patterns due to the changing standard of living, the ever-present need of flexibility in transmission and satisfying the demand for peak loads, have evoked co-operation on an increasing scale between public and private power producers in the Province of Quebec. This identification of mutual interests and the resulting co-operation have provided power-users in Quebec with a maximum degree of security and reliability of service. Hydro-electric power in the province flows with a fluidity that parallels the currency in our mercantile and banking establishments.

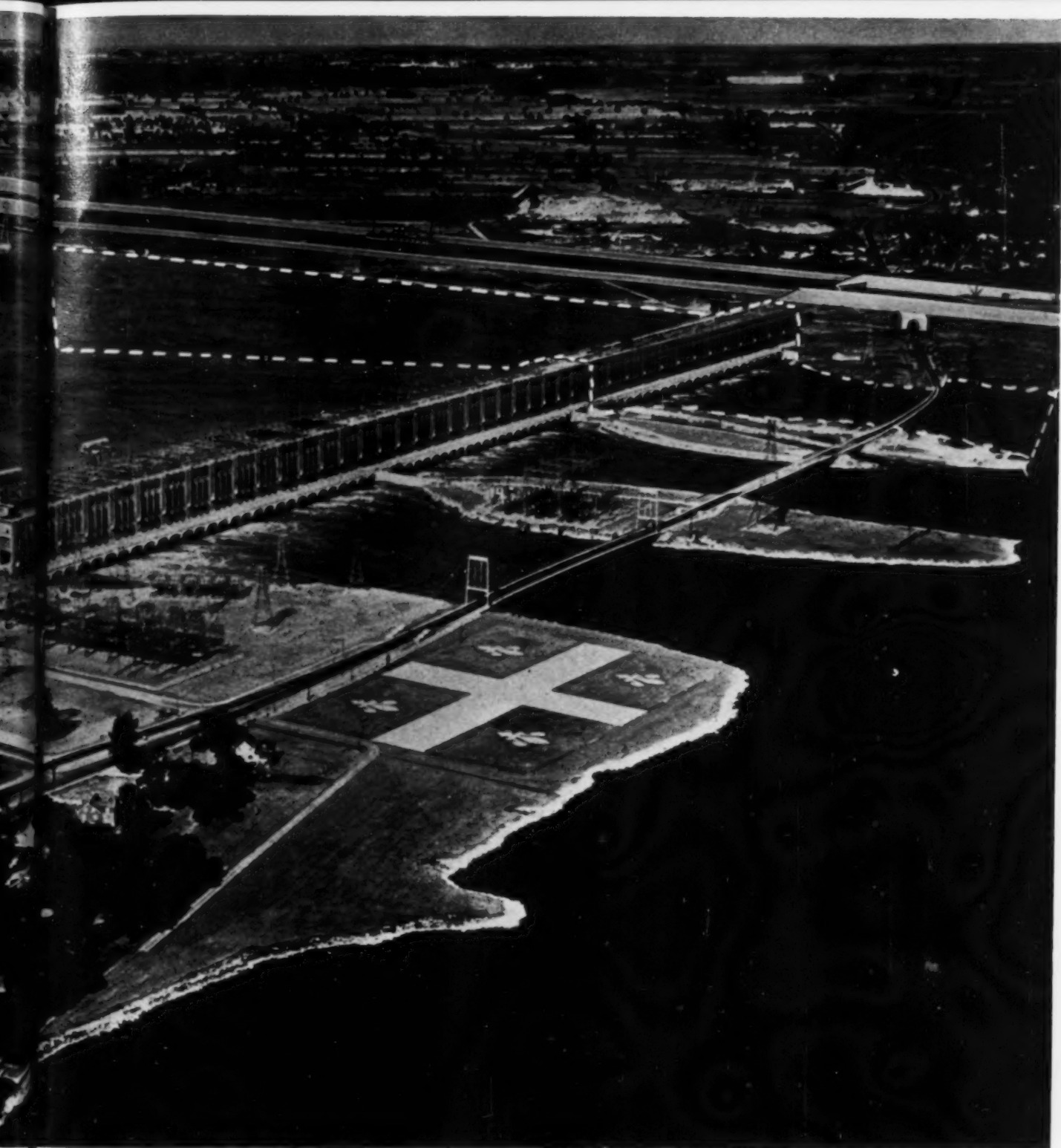
The topography of Quebec lends itself favourably to the development of hydro-electric power. The vast Precambrian Shield with its 71,000 square miles of fresh water — the countless lakes and rivers — occupies over ninety-three per cent of the total area of the province. On this rugged, mountainous terrain falls an annual precipitation averaging forty inches, particularly well distributed throughout the

year, varying from a high of 3.76 inches in January to a low of 2.6 inches in April.

During the winter, the entire Laurentian Shield serves as a natural storage reservoir for about 100 inches of snow, the equivalent of ten inches of rain. In the spring, when the snow melts, much of the run-off is trapped to refill man-made reservoirs with a capacity of approximately 1,300 billion cubic feet of water. The reservoirs are used to maintain, at a much higher level than would otherwise be possible, the normal flow of all important rivers in Quebec. Illustrating the utility of this process is the effect of 365 billion cubic feet of storage capacity in the many reservoirs on the St. Maurice River. This reservoir system has transformed the potential power of that river from 650,000 horsepower under normal flow to 2,500,000 horsepower under average regulated conditions, an increase of almost 400 per cent. Comparable results are obtained on the Saguenay, Ottawa, Gatineau, Bersimis, Manicouagan and other rivers.



Generators at Beauharnois now deliver 1,425,000 horsepower. Work is in progress to add 730,000 horsepower.




Much of the electrical energy for the thriving metropolis of Montreal comes from Quebec Hydro's Beauharnois plant, on the St. Lawrence River, thirty miles west of the city. Developed in stages, the Beauharnois plant has an installed capacity of 1,425,000 horsepower. When work is completed on the unit outlined by the dotted area, Beauharnois will have an installed capacity of 2,155,000 horsepower, and may well be the world's largest generating station.



The Manouan storage dam, built by the Aluminum Company of Canada Limited, in 1941, creates a water-filled reservoir 150 square miles in area at the headwaters of one of the main tributaries of the Peribonka River which feeds the Saguenay system. Such storage dams regulate the run-off of water through generating stations miles below the dams. This reservoir made possible the expansion of power and aluminum producing facilities in the Saguenay Valley.

Right:—Aerial view of the Shipshaw power project in the Saguenay Valley. In the background is Chute-à-Caron and its dam, which diverts the Saguenay River into a one-and-one-half mile channel leading to the intake structure of the powerhouse. Water drops 210 feet through six steel-lined penstocks to turn twelve generators rated at 100,000 horsepower each in this Shipshaw station.



Quebec's hydro-electric power comes from 500 different plants on the many power rivers of the province. These plants are grouped in generating stations ranging in installed capacity from as little as twenty horsepower to as much as 1,400,000 horsepower. Her largest producing rivers are the Saguenay, with 2,776,000 horsepower; the St. Maurice, with 1,695,000; the St. Lawrence, with 1,658,000; and the Ottawa, with 1,415,000. Joining this distinguished company in 1956 was the Bersimis, which will eventually produce about 2,000,000 horsepower. By the end of 1961, the generating stations on Quebec rivers will have an installed capacity in excess of 12,000,000 horsepower.

For many years, Norway led all countries in installed hydro-electric power on a *per capita* basis, with 1.5 horsepower per person. Canada was in second position with 1.1 horsepower per



The power station on the Menihék River, approximately 330 miles north of Sept Îles, has a generating capacity of 12,000 horsepower. This station was constructed to provide power to the new iron ore mining industry at Schefferville, on the shores of Knob Lake, about thirty miles away.

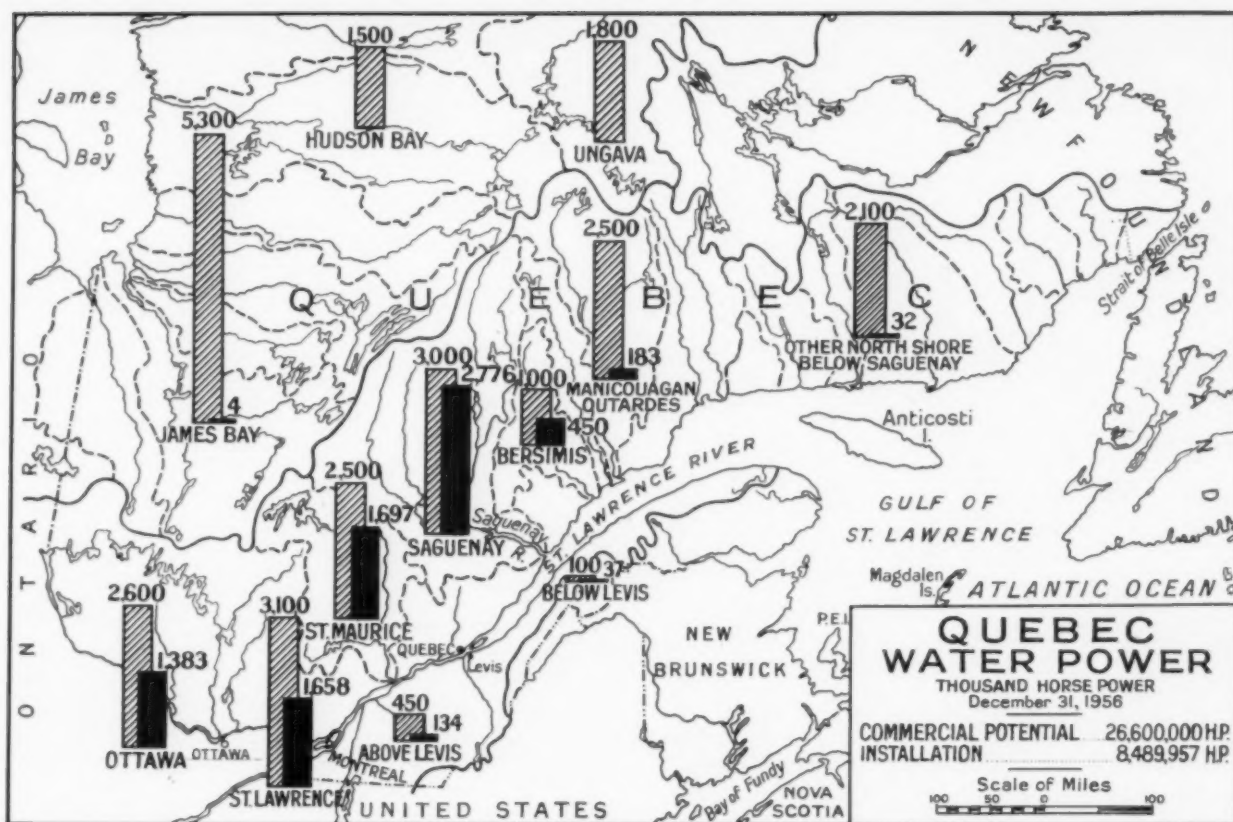
person, but Quebec with her total of 1.7 is now high above the Canadian average. In comparison, the United States has an installed capacity of .2 hydro-electric power per person; France .2; Italy .19; and the Soviet Union .03.

Having already developed hydro-electric power on a more extensive scale than any other country in the world, and with impressive power potential yet to be developed, Quebec has moved rapidly forward in the utilization of this form of energy. In the rural areas of Quebec, more than 90 per cent of the homes enjoy the economic advantages and living conveniences of hydro-electric power. The rapid rise of Quebec's industrial strength has been made possible by the aggressive development of this form of supplement to human energy.

Major producers of hydro-electric power in Quebec in terms of installed horsepower capacity at the end of 1956 were: the Aluminum Company of Canada, 2,040,000; the Shawinigan Water and Power Company, 1,721,200; the

Quebec Hydro-Electric Commission, 2,212,400; the Gatineau Power Company, 814,094; the Saguenay Power Company, 540,000; McLaren-Quebec Power Company, 276,300; Price Brothers Company, 150,900; Northern Quebec Power Company, 119,000; Manicouagan Power Company, 112,400; and Ottawa Valley Power Company, 112,000.

Full advantage of the developed hydro-electric power installations of the province could not be enjoyed if the power were available only where it is developed. At locations where large quantities of power are required, power sites may not be available in sufficient size, and long and expensive transmission facilities may be required. Also, in an area as large as Quebec, seasonal variations are not uniform. In the southern section of the province, spring occurs from two weeks to a month earlier than in the Saguenay or Bersimis regions. The lower St. Maurice area will have mild weather earlier and longer than the upper section. Conversely,



Sketch of Quebec showing the distribution of the province's developed and potential hydro-electric capacity. Already the world's largest producer on a per capita basis, Quebec has developed only about one-third of her potential power.

Interior of the great Shipshaw powerhouse in the Saguenay Valley. Situated at tide-water, nearly 1,000 miles from the ocean, this development serves the nearby Arvida aluminum smelter which has made Canada world famous for its light metal industry.

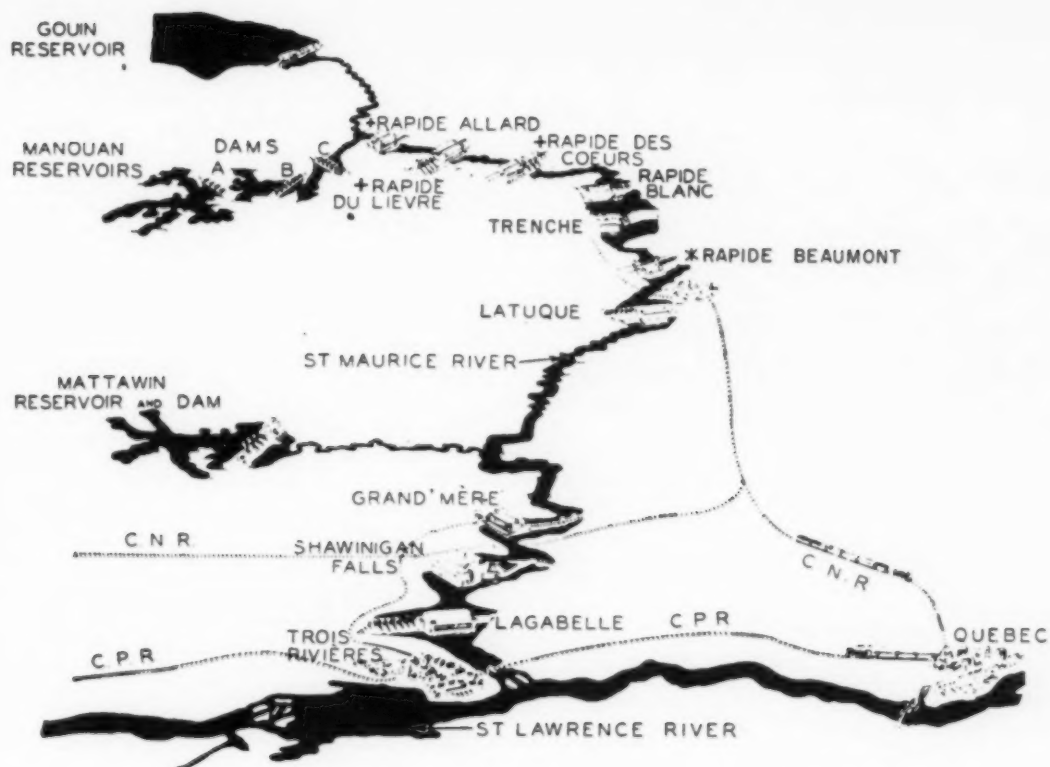




Shawinigan Falls, now a thriving industrial city, was a wilderness settlement when the first hydro-electric installation was established there between 1898 and 1901. Stations at Shawinigan Falls now generate 310,700 kilowatts.

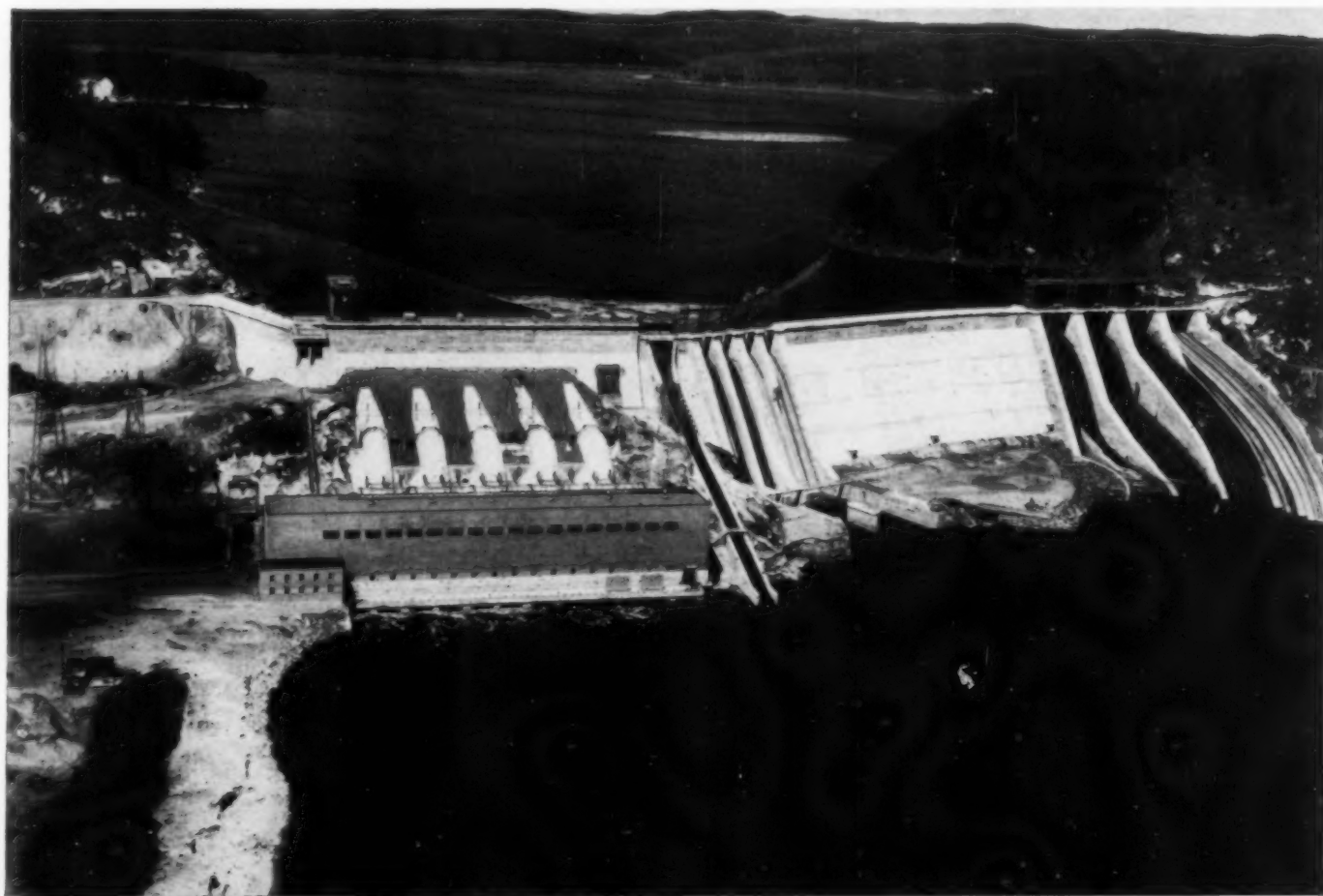
The LaTuque station on the St. Maurice River has an installed capacity of 202,500 kilowatts. Ten miles above LaTuque, at Rapide Beaumont, a new 246,200-kilowatt development is now under construction. Three stations with a potential of 286,500 kilowatts remain to be developed on this waterway.

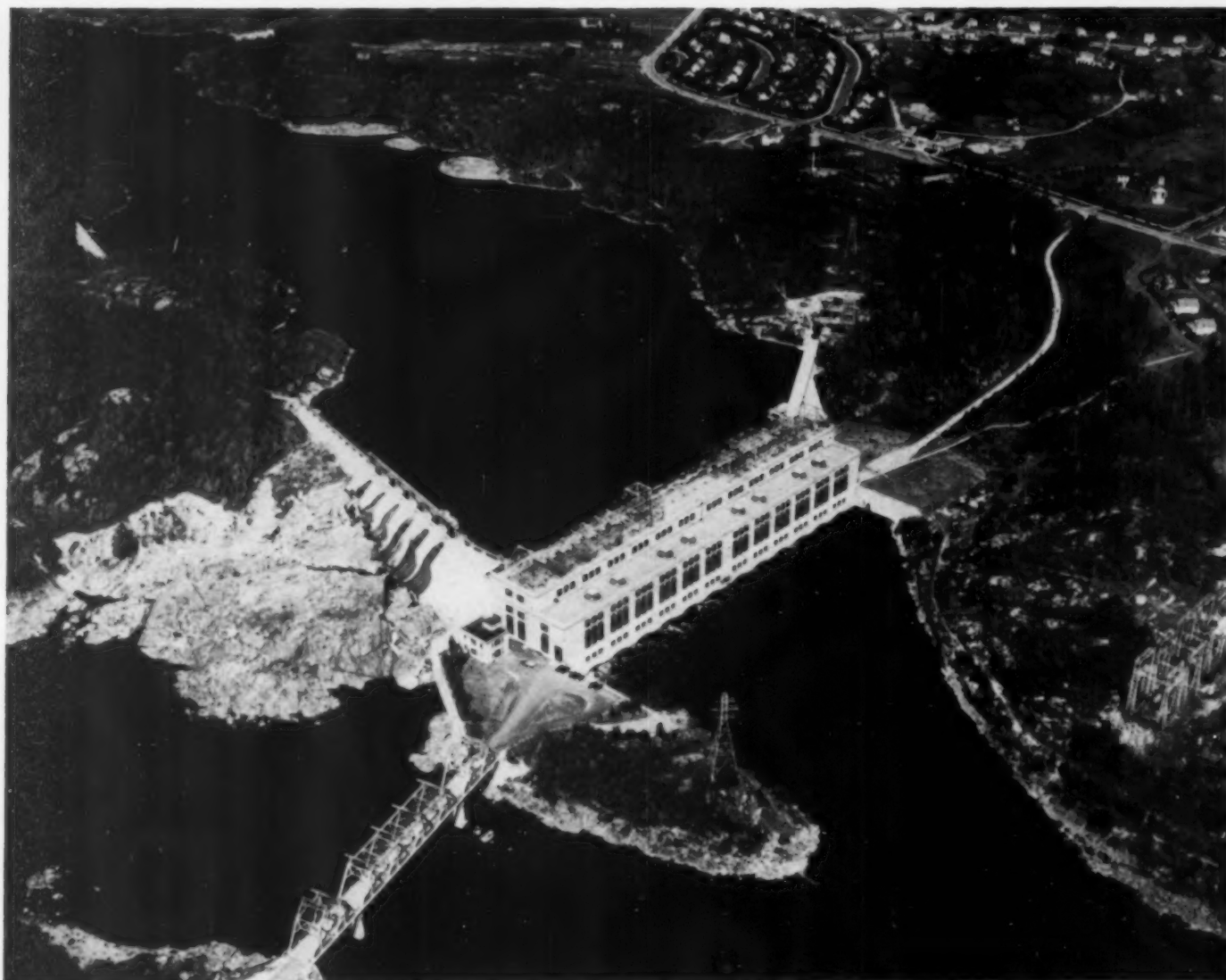




This sketch shows how the St. Maurice River has been harnessed to provide 1,264,400 kilowatts of electrical energy.

Trenche, on the St. Maurice, with a capacity of 290,900 kilowatts, is the second largest station in the Shawinigan system.





The Isle Maligne power station at the outlet of Lake St. John, which empties into the Saguenay River. When the plant commenced operations in 1925 it was the largest hydro-electric station in the world. Subsequent additions brought installed capacity to 540,000 horsepower.

the onset of winter conditions will usually occur later where spring is earlier. These differences can occur also to a minor extent within one generation district due to variations in topography such as elevation.

Recognizing the inherent possibilities of mutual aid, the major public and private power producers have voluntarily arranged an interconnected grid system to utilize the available power with a minimum of waste.

The Quebec Hydro-Electric Commission and the Shawinigan Water and Power Company have a strong interconnection between the St. Maurice and Montreal-Beauharnois areas, and the new Bersimis development is tied with the Shawinigan system at Charlesbourg near Quebec. In the Bersimis area, an interconnection exists with the Manicouagan

Power Company. From Quebec a double-circuit tie-line runs from the Shawinigan system to the Saguenay Power Company at Isle Maligne. This provides transfer facilities to the Saguenay power system which is solidly joined to the generation facilities of the Aluminum Company of Canada, Limited.

At Isle Maligne, Price Brothers have tie facilities with the Saguenay Power Company. At Quebec, the distribution facilities of the Shawinigan system are also connected to those of the Quebec Power Company. Shawinigan is also tied with the generating system of the Southern Canada Power Company.

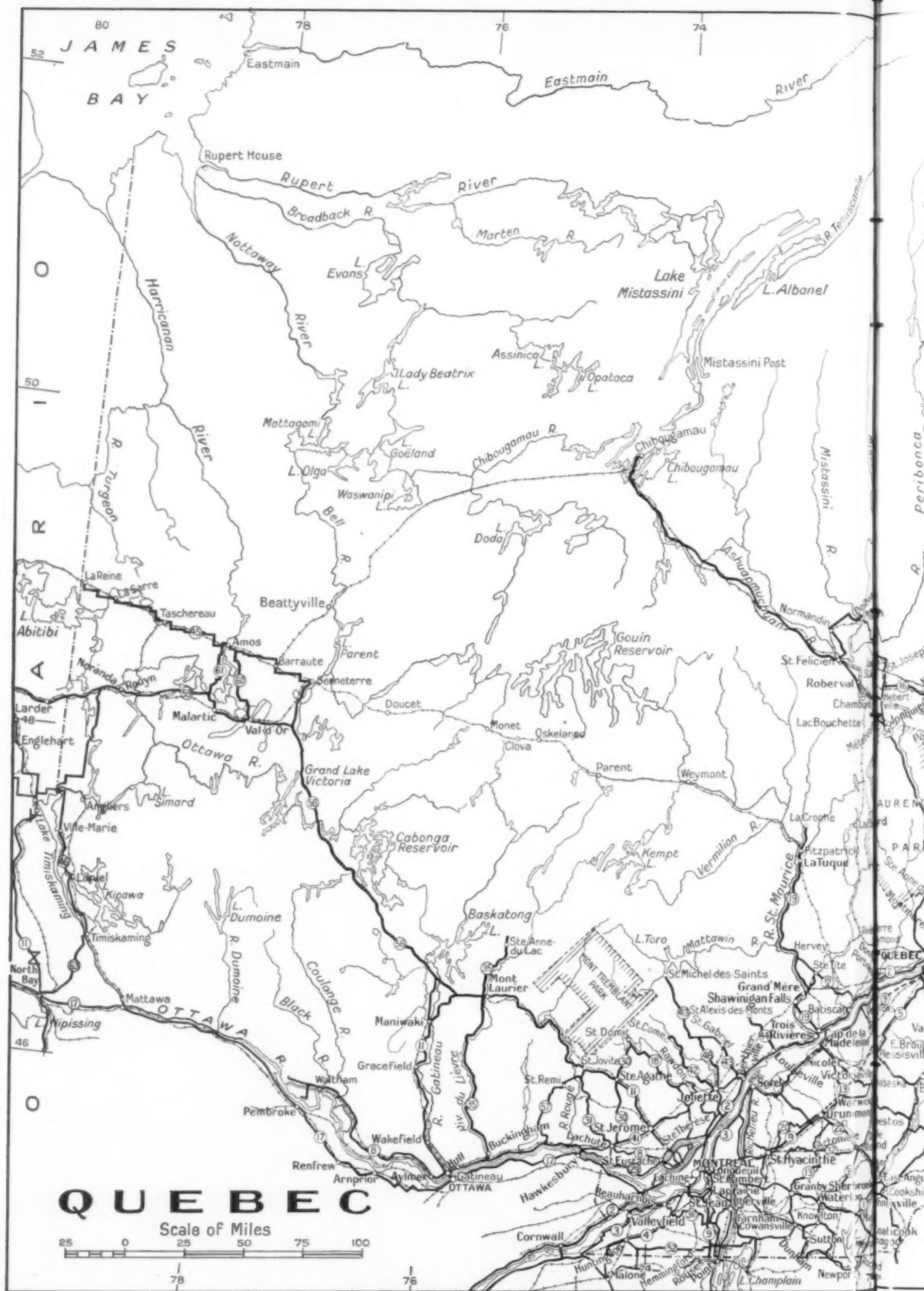
The Quebec Hydro-Electric Commission also has power interconnections with the Gati-neau Power Company and other utilities within the province. As additional insurance, there

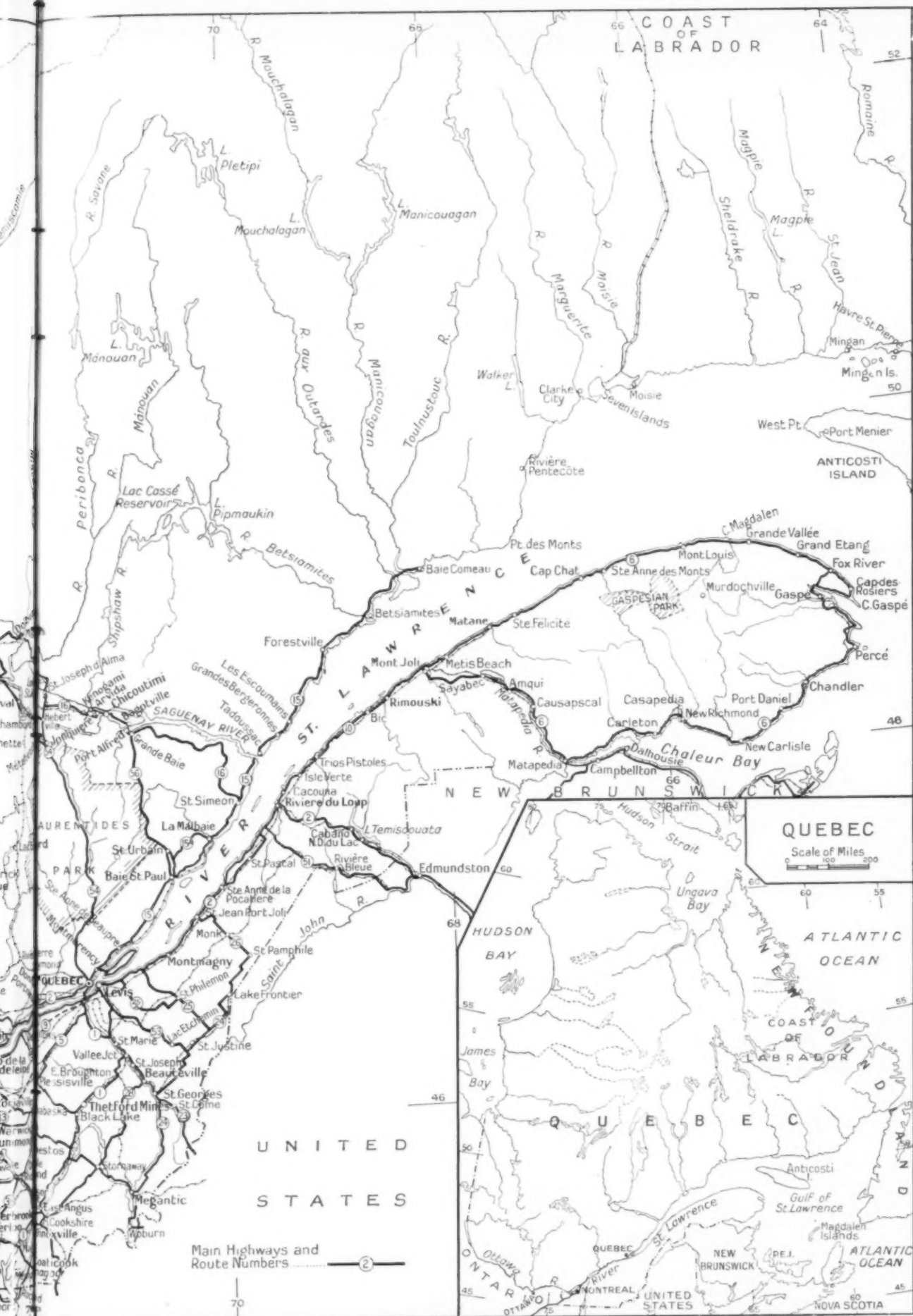
Right:—The Chute-à-Caron station on the Saguenay River, established in 1926, was the first stage of the great Shipshaw power development. Built by the Aluminum Company of Canada, Limited, it began feeding power to the newly-established aluminum industry in 1928. Canal to right leads to the Shipshaw installations. Chute-à-Caron's capacity of 300,000 horsepower is now used only in the event of machine failures at Shipshaw or during periods of surplus water.



The Pagan Falls plant of the Gatineau Power Company on the Gatineau River has recently increased its capacity from 238,000 to 285,000 horsepower. Situated about thirty-six miles north of Ottawa, Pagan is one of four Gatineau Power Company installations on this river. Flumes to right of the powerhouse provide for the heavy traffic of logs down this river.









Canadian Geographical Journal map of Bersimis project.

power for areas where the season is retarded. When the run-off is greater in the retarded area, the early section may have passed its maximum period and be able to utilize the excess from the second section.

Interconnected facilities within the province provide an integrated system in excess of 8,000,000 horsepower of hydro-electric power.

If Quebec's record in the development of hydro-electric power is outstandingly impressive, the undeveloped potential at her disposal is equally impressive. Continued industrial and population growth within the province will produce requirements for additional hydro-electric power on a scale which is difficult to forecast. The electrified home of the early twenties probably enjoyed electric lighting and possibly one minor electrically operated appliance. Today, the modern home is a centre of "electrical living", with numerous electrically operated units in every room. The introduction, for example, of 1,000,000 new television sets, taken collectively, represents the equivalent addition of peak loads of a city of a quarter of a million people.

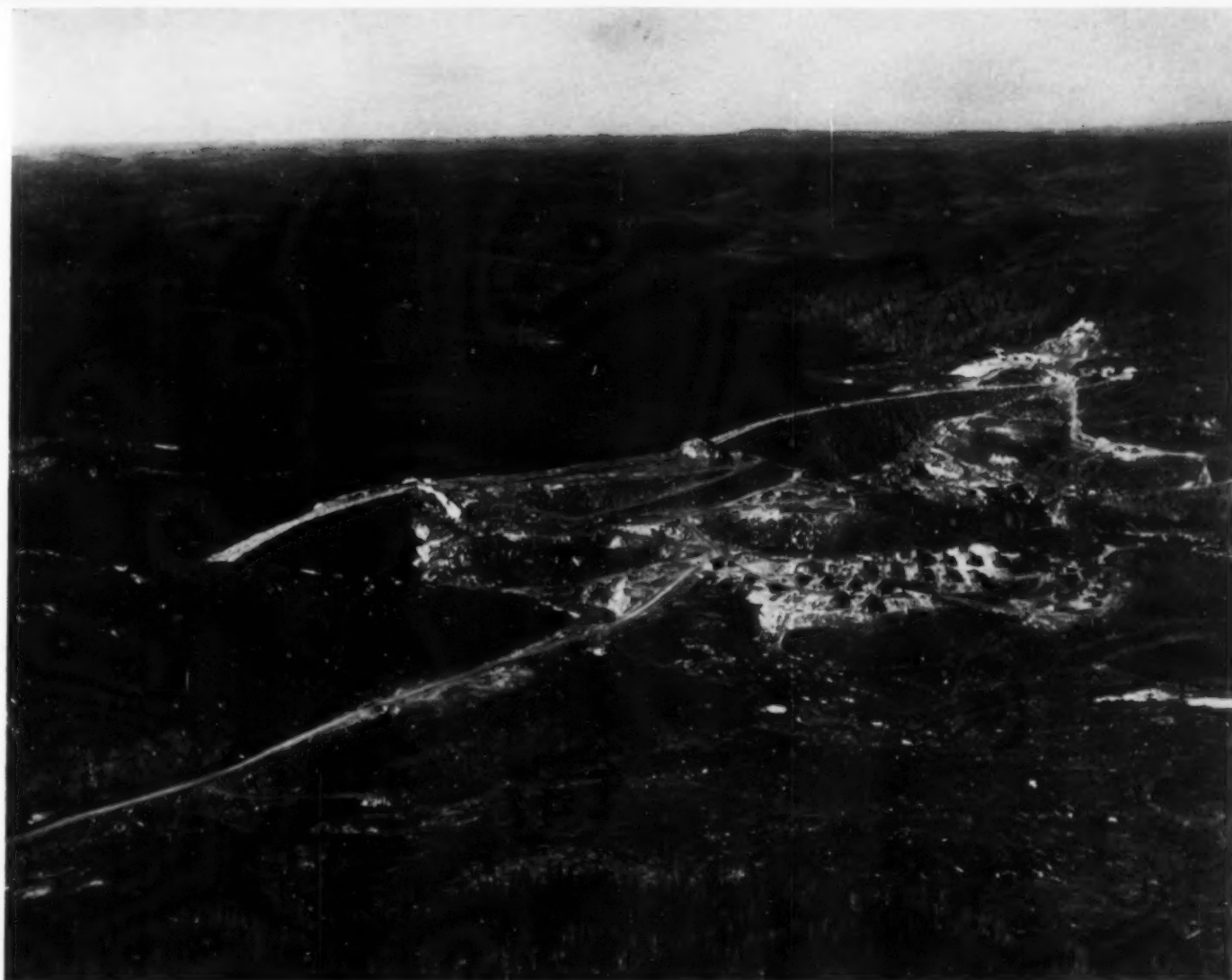
Such is Quebec's undeveloped power potential, that regardless of the pace of expansion in industrial and consumer demand, there is reasonable assurance that hydro-electric power will be available to make it possible. Quebec's undeveloped power potential also provides insurance against exhaustion of hydro-electric power enjoyed by few areas in the world. This potential is even now being rapidly developed into usable electric energy. On the Saguenay, St. Maurice and Bersimis, additional power is being harnessed.

The Bersimis development on the north shore of the St. Lawrence River, 200 miles below Quebec, has been undertaken by the provincially-owned Quebec Hydro-Electric Commission. This new source of energy will add some 2,000,000 horsepower to the resources of a province whose economy and progress are based on the power-producing rivers fed by 600,000 square miles of watershed. Located in the forest-covered terrain of the North Shore, some 400 miles from Montreal, this young giant has pioneered the trend towards bringing power to industry instead of making sources of

exist at present transfer facilities between this Commission and the Ontario Hydro-Electric Commission, and there are new tie points in the process of construction. There are also facilities to connect the Bersimis area directly to the Quebec Hydro-Electric Commission system at Montreal.

With maximum demand occurring at varying times on the various systems, these interconnections allow maximum use of the installed facilities without, in many cases, any actual loss of power by the producers. Power provided for peak periods is returned over a longer off-peak period, with the result that storage water is utilized to the best advantage.

Seasonal variations allow water which might be spilled past the generating stations, if no interconnections existed, to be used to generate



Desroches and Bersimis dams, which divert the waters of the Bersimis River to the intake terminal, are part of the great project which ultimately will give the Bersimis a power-producing capacity in excess of 2,000,000 horsepower. Approximately 200 miles downstream from Quebec City and 100 miles inland from the St. Lawrence, the Bersimis project represents an engineering feat of first magnitude.

Generators in the powerhouse at Bersimis. The Bersimis I power plant will generate 1,200,000 horsepower. Bersimis II is scheduled to yield 850,000 horsepower. The development provides power to new industries on the North and South Shores of the St. Lawrence.





*Left:—
Labrieville, the permanent townsite of the Bersimis River development of Quebec Hydro-Electric Commission.*

*Below:--
Surge tank, rising through 678 feet of mountain above the 7½-mile tunnel which leads the water to the Bersimis powerhouse.*



Microwave communication system linking Bersimis I, Bersimis II, Montreal and Beauharnois.

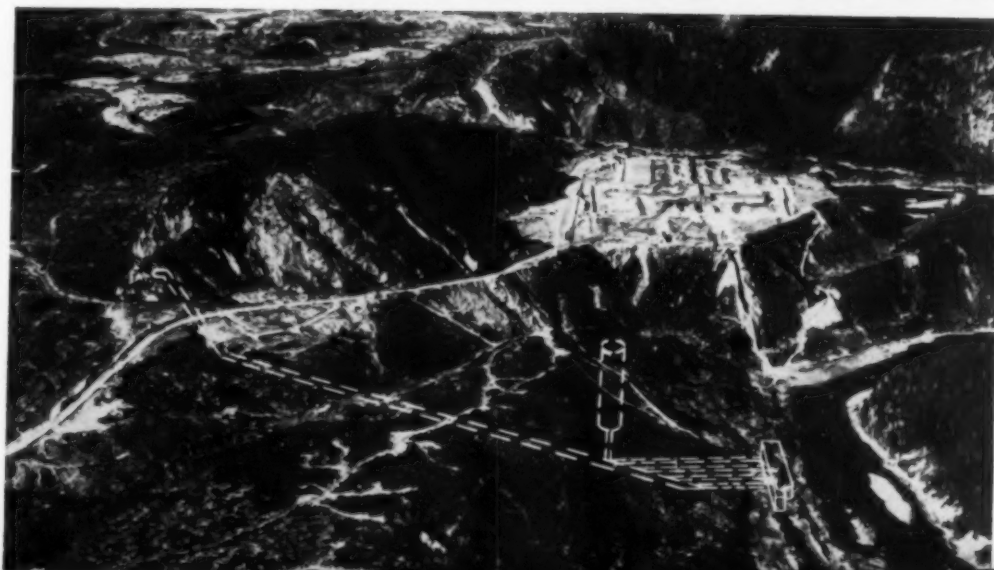
such energy the hub of industrial areas. Circumstances have dictated this long-distance transmission step, since establishment of industrial enterprises of major proportions close to future power sites of any magnitude would be financially prohibitive.

The principal features of this Bersimis development, described by competent authority as "one of the most brilliant engineering achievements Canada has ever witnessed", are its 7.6-mile tunnel of 31.5-foot diameter through solid rock, its power-house set into a mountain-side and its 300,000-volt transmission lines, the highest tension ever attempted in Eastern Canada. They will carry energy towards Montreal for allocation into a network whose lines reach into every section of the province.

The Bersimis and Beauharnois plants will be grouped among Quebec's generating stations that range in installation from as little as twenty to as much as 1,400,000 horsepower, many of them among the world's largest hydro-electric plants. Their production, together with the output of other projects under study at present, will provide Quebec with about one-half the Canadian installation, one-quarter of the United States installation, and one-sixteenth of the world's total. With her already developed power of 8,000,000 horsepower, a target total of 12,000,000 by 1961, and immense potential yet undeveloped, including about 1,000,000 on the St. Lawrence at Montreal's back door, Quebec is uniquely endowed with an asset which unites a self-perpetuating utility and reliability in a manner which ensures expansion for years to come.

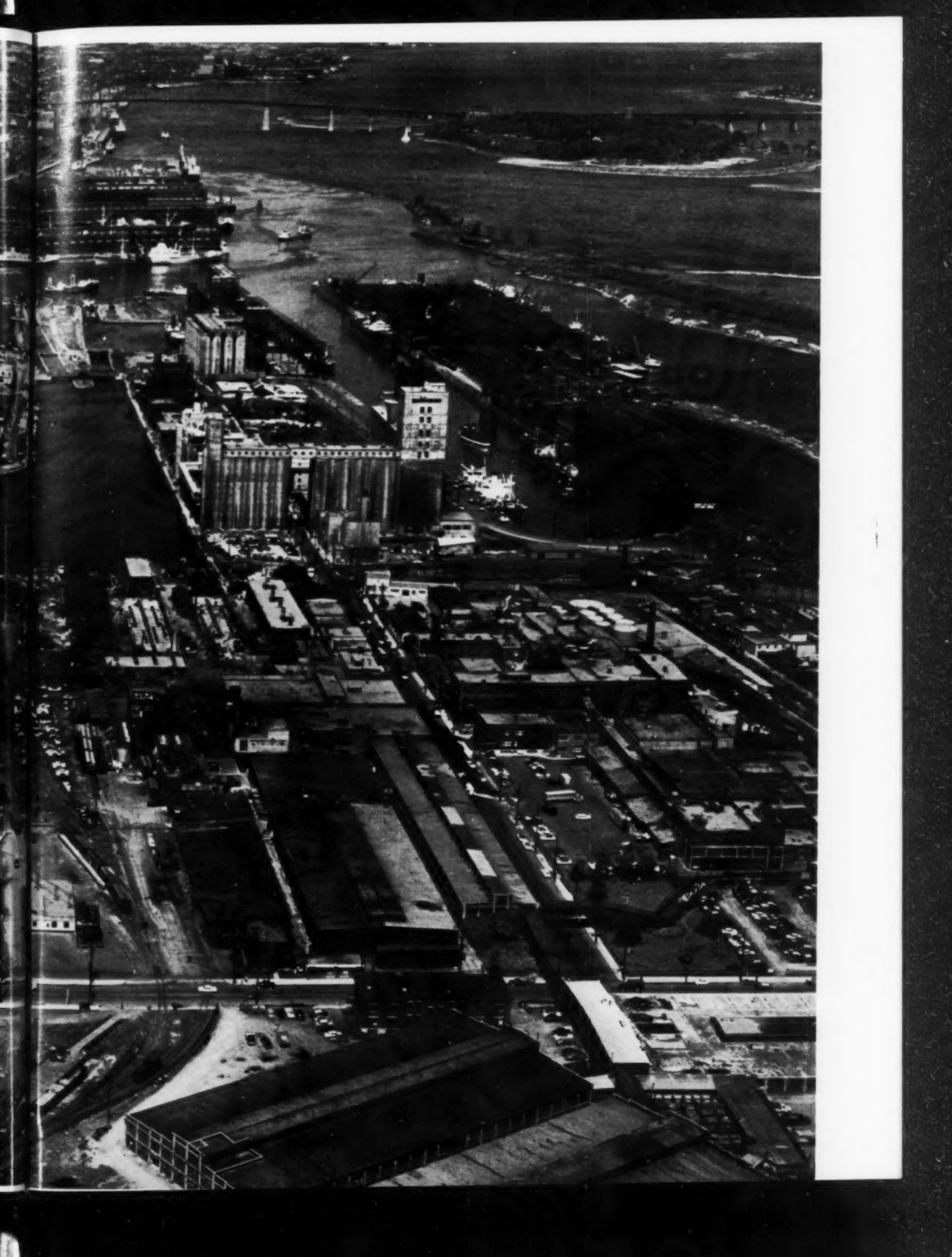


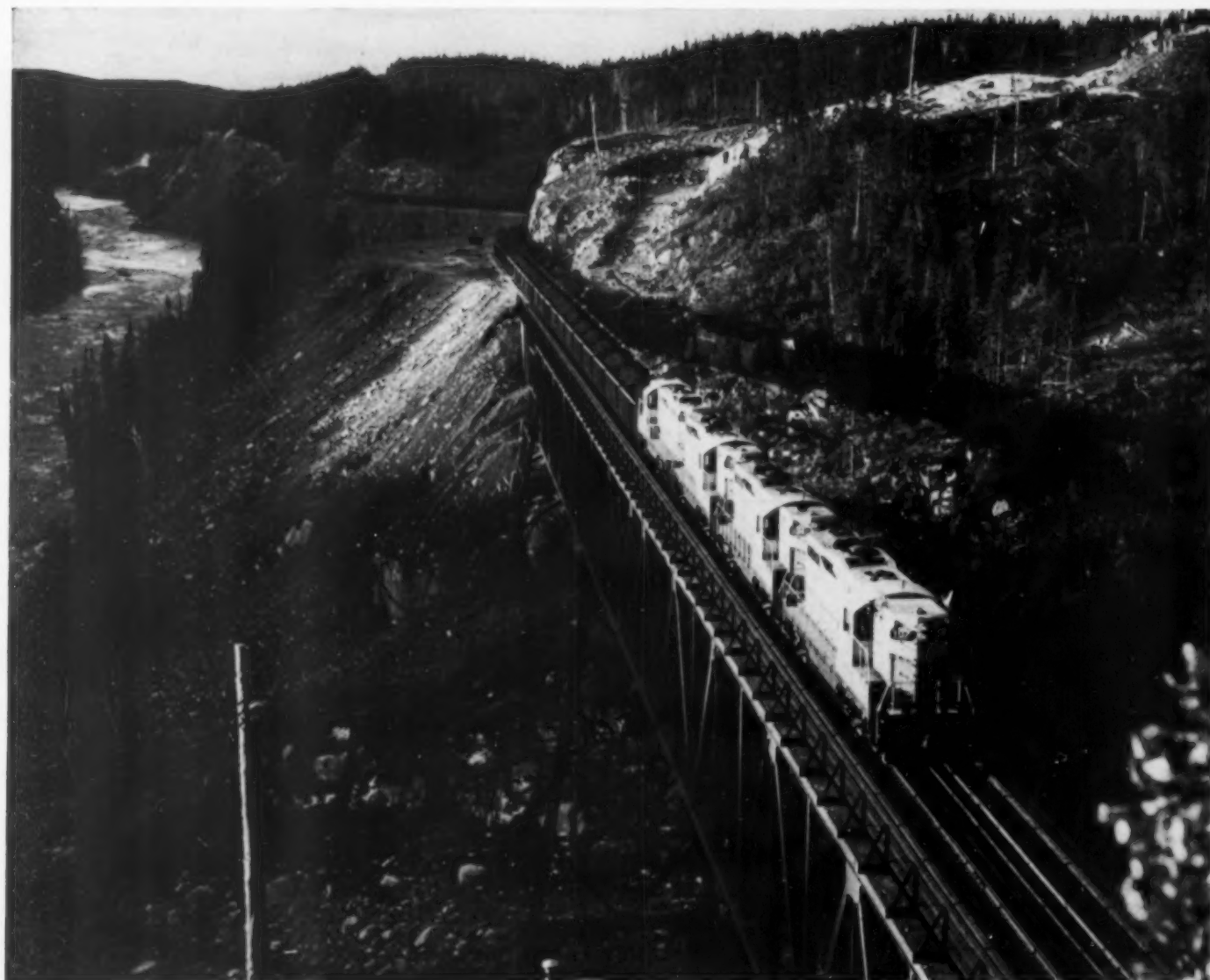
Dotted line shows the 3,000-foot tunnel, 33 feet in diameter, which will bring stored-up water to the Bersimis II powerhouse, through underground penstocks. Outlined also is the surge tank which will rise some 240 feet from the tunnel through the mountain. The head (drop) at Bersimis II is 360 feet while the drop at Bersimis I is 875 feet.





Heavy industrialized Montreal with its population of more than 1,595,000 is unique among great cities in its source of electricity. Thirty miles west is the Beauharnois system on the St. Lawrence, which will soon have an installed capacity of 2,155,000 horsepower. A 200,000 horsepower installation at Cedars and a 60,000 horsepower station at Rivière des Prairies augment the supply of power from the St. Lawrence. Power is already flowing into Montreal from Bersimis, 350 miles to the northeast. When this project is completed, Montreal will be served by two giant hydroelectric installations, each with a capacity of 2,000,000 horsepower. In 1956 Quebec Hydro delivered to industrial customers in Montreal more than two billion kilowatt hours of electricity.





Twelve miles north of Seven Islands, an ore train crosses one of the seventeen bridges along the 360-mile route of the Quebec North Shore and Labrador Railway from Knob Lake. Several trains make the trip every day during summer, each with more than 100 cars.

Iron Ore Company of Canada

Knob Lake on Canada's New Frontier

by W. GILLIES ROSS

Photographs by author except where credited

KNOB LAKE lies near the Quebec-Labrador boundary in the heart of the immense peninsula of Labrador-Ungava. For centuries a neglected area of barren, wind-swept desolation, it is today one of Canada's most valuable assets; its rich deposits of iron ore are now being relinquished to modern industry. Where twenty years ago human activity was confined to a few Montagnais In-

dians tending winter trap lines, there is now on the shores of Knob Lake a community of over 2,000 people, served by air and rail. Its name is Schefferville, after Monseigneur Lionel Scheffer, O.M.I., Bishop of Labrador, whose spiritual missions in his vicariate of 350,000 square miles have become legend.

Schefferville was built by the Iron Ore Company of Canada. This group of American and

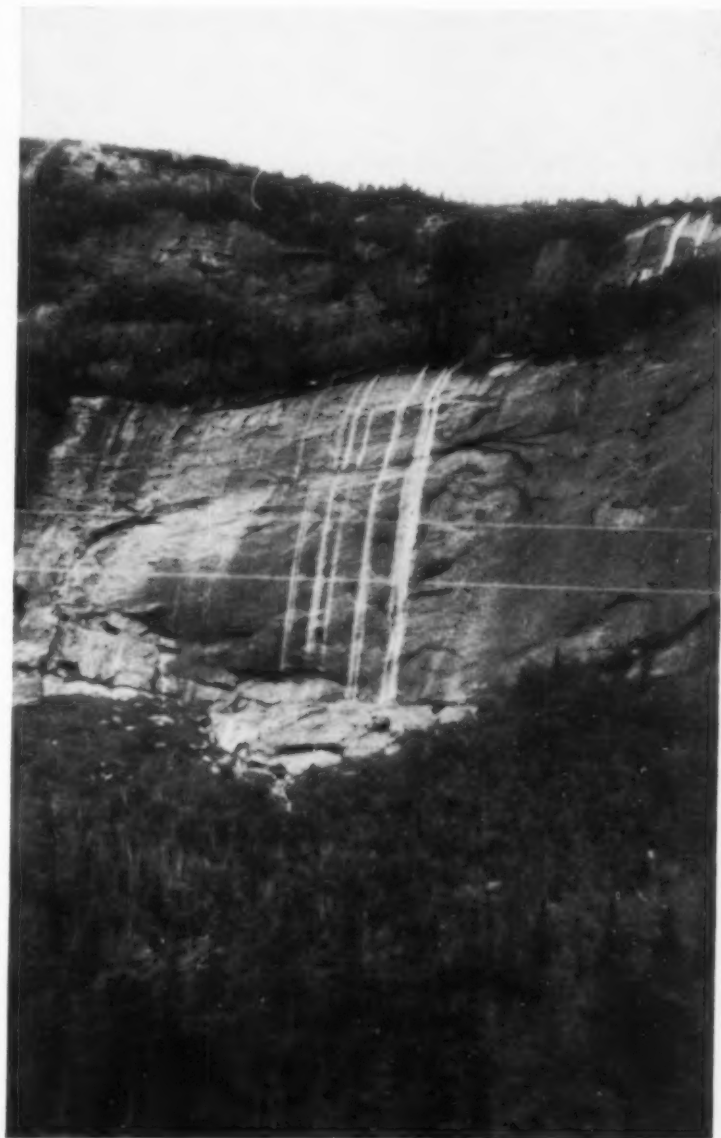
Canadian mining companies decided in 1950 that the iron ore deposits of the Knob Lake area could no longer be ignored. The steel demands at the time of the Korean War, and the foreseeable depletion of the iron ore of the Mesabi Range of the United States, were both factors in this decision to open up the centre of Labrador-Ungava. Briefly, the company's project consisted of the construction of dock facilities and a townsite with adequate power supply at the port of Seven Islands, the building of a railway from Seven Islands to the ore deposits at Knob Lake, the construction of a town at Knob Lake, supplied with power from a dam at Menihok, thirty miles to the south, and the development of the mines themselves.

The beginning of this project in 1950 was a historic event. The interior of Labrador-Ungava, an immensity of some half-million square miles, had long been one of the world's least-known areas. Even today, despite the exploration and development in certain regions by mining interests, the construction of early warning sites on two defence lines across the peninsula, and the research projects carried out by students of the natural sciences, the area has hardly been touched.

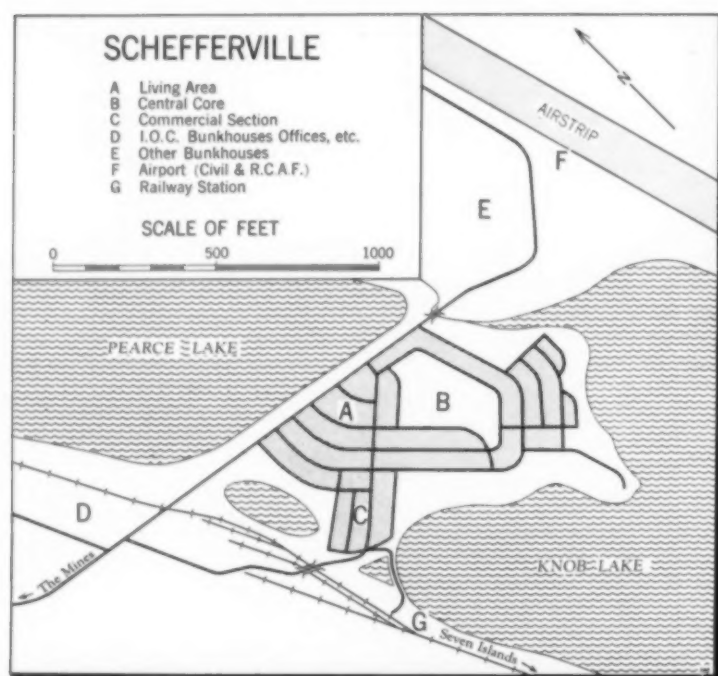
Continually bypassed by explorers, traders, and settlers, this land was an uninviting wilderness north of the convenient waterway of the St. Lawrence through most of the last four centuries. La Salle reached the Gulf of Mexico in 1682, and Mackenzie crossed to the Pacific in 1793, but it was not until 1826 that Hendry travelled from Hudson Bay overland to Ungava Bay to mark the beginning of exploration in Labrador-Ungava. In the years which followed, voyages by Erlandson, McLean, Babel, Low and others brought the first knowledge of the interior to the civilized world. Low's marvelous canoe voyages were undertaken less than seventy years ago; the first mineral concession in the interior was granted only twenty years ago, and the first ore was shipped out of Knob Lake only in 1954.

Consequently, knowledge of the area and its

inhabitants before the entrance of white man is patchy. Sometime in the past, Indians of Algonkian stock moved eastward into the peninsula in successive waves, and with pressure from Iroquois and Micmac tribes in the sixteenth and seventeenth centuries respectively they became more and more isolated from other Algonkian tribes. They became known as Montagnais along the north shore of the St. Lawrence and in the southern forests, and as Naskapi in the northern forest-tundra region. The establishment of fur-trading posts, first along the coasts, and in the interior during the nineteenth century, converted many Indians from subsistence hunting to trapping. When the mysterious decline of the caribou population was noticed by Low nearly seventy years ago, the Indians were turning to economic ties with the white man in sheer desperation. Unfor-



These cascades of water, dropping down a long steep rock face, are one of the many picturesque features of the railway's route from Seven Islands to Knob Lake.



The town of Schefferville stands on a neck of fluvioglacial land between Knob and Pearce Lakes. A diagram of the townsite.

C.G.J. map

tunately, the notorious fluctuations in fur prices, and depletion of animals made the trapping life insecure and generally unrewarding. It is significant, therefore, that the recent mining development in the Knob Lake area has offered important new opportunities to the Indians and has attracted large numbers from both Montagnais and Naskapi bands.

In the industrial penetration of Labrador-Ungava, the event which "broke the ice" was the construction of the Quebec North Shore and Labrador Railway from the port of Seven Islands northwards to the iron ore deposits of the Knob Lake area — 360 miles over exceedingly difficult terrain. The first equipment was unloaded at Seven Islands in the autumn of 1950; a base was established, docks were constructed, and crews began building a road-bed up through the steep-walled valleys of the incised rivers cutting through the rim of the Laurentian Plateau. Slowly work progressed as the route twisted up the Moisie, Nipissis and Wacouno Rivers, crossing seventeen bridges and going through two tunnels. Frequent landslides, and a mean winter snowfall in excess of 150 inches were only two of the many difficul-

ties which beset the construction crews. At Mile 150 and altitude 2,055 feet above sea-level the climb was finished. Construction was somewhat less spectacular across the lake plateau country, although the notoriously bad drainage of this glaciated Canadian Shield topography was a serious problem. High winter winds and low temperatures made severe conditions for working and living. In February, 1954, four years after the project was begun at Seven Islands, the last spike was driven at Schefferville.

A singular feature of the railway's construction was its supply by air. The fifteen planes of Hollinger-Ungava Transport, a subsidiary of the Iron Ore Company, leap-frogged up the line along a series of fourteen landing strips, carrying men, food, fuel, material and equipment. Trucks, tracked vehicles, and two helicopters transported cargo from the strips to the construction sites. At the peak of activity almost 7,000 men were employed, involving complicated problems of messing and accommodation. The railway has been described as "one of the longest stretches of railroad construction on the continent in this century and



The effect of large-scale mining activity on the landscape is shown in this view of Gagnon Mines near Knob Lake. A hillside of iron ore has been removed to feed the blast furnaces of modern industry.

the only one in history built by air". Under the difficult conditions imposed by climate and topography it was an enormous undertaking, and a great achievement for Canadian engineers.

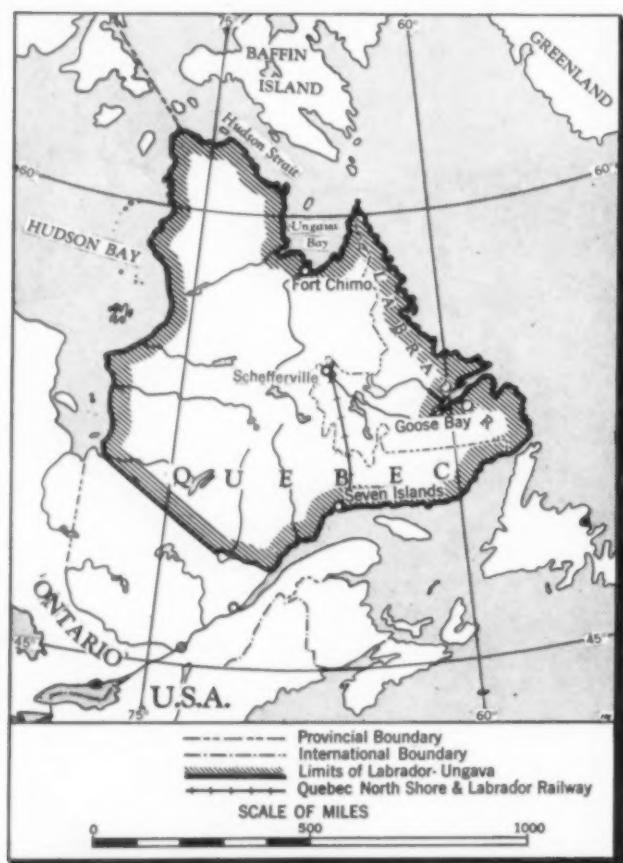
As the railway pushed northward, there was much activity in the vicinity of Knob Lake, so that by the time it was in operation there was a mining community, supplied with hydro-electric power from the Menihek Lakes, and already producing iron ore. During the summer of 1954 over two million tons of ore were transported by rail to Seven Islands, and shipped to markets.

The problem of location of the Schefferville townsite was mainly to find a well-drained area reasonably close to the ore bodies and to a good airfield site. Burnt Creek was originally chosen; but when a chance drilling revealed that directly underneath the proposed site there were

At the Gagnon Mine, ore is scooped out of the hill by large electric shovels, loaded into thirty-five-ton trucks, and driven to hoppers, where it is crushed and graded, then loaded into railway cars.

Iron Ore Company of Canada photographs





C.G.J. map

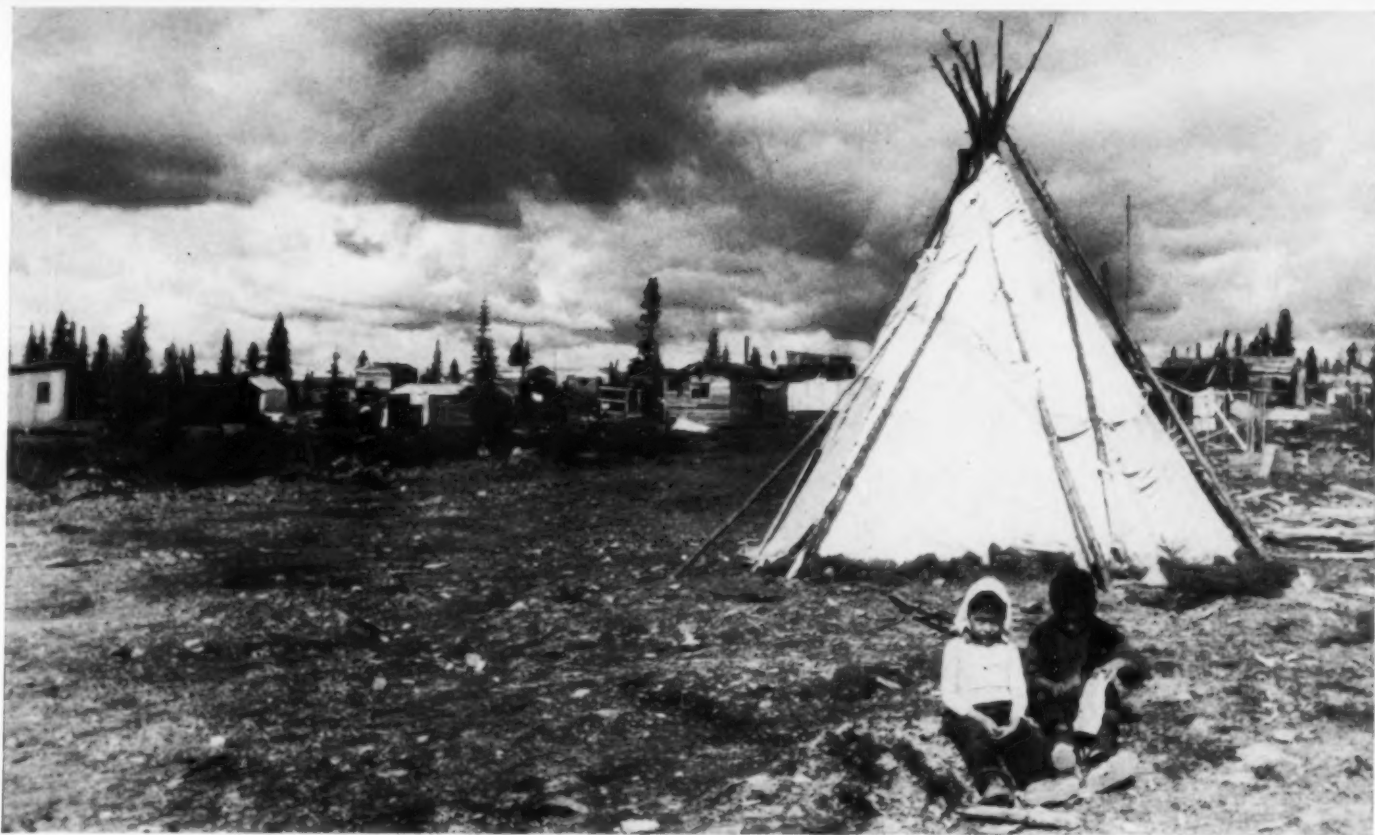
more than ten million tons of high grade ore, the location was changed to its present one on the neck of fluvio-glacial sands and gravels separating Knob and Pearce Lakes. The town of Schefferville is served by the air-strip on the east and the railway on the west. The Ruth, French, Gagnon and Gill mines are only a few miles to the north-west.

Today at Knob Lake the orderly streets of the modern town of Schefferville run in arcs between symmetrical rows of brightly painted houses. Construction is everywhere in progress; homes, a school, a church, a cinema, a bank, are triumphant, even arrogant, manifestations of man's conquest of nature. It is a transplanted civilization cast up boldly among the silent spruce. From this hub of settlement man's conquest spreads radially outward in power-driven tentacles, pushing the lichen woodlands back with shovels and trucks, men and toil. In the vast, gaping, dusty pits huge machines scrape incessantly at the lifeless ore, the food of man's industry.

The appearance of Schefferville nowhere sug-

gests that it was planned with a special consideration of the climate. It looks like any well-laid-out mining town of lower latitudes, yet it seems adequate. The single, double, and four-family dwellings, although possibly an uneconomical answer to the demands of northern housing, have the advantage of giving the inhabitants a sense of privacy and eventual ownership that is more appealing than any system of large centralized apartment buildings. The town plan is characterized by a division of functional units which contributes to convenience and efficiency, as well as to comfort and appearance. Its elements are a central core, which contains a school and a church, with provision for other religious and educational units; the living area of family dwellings on a modified circular plan surrounding the core; the commercial area of shops, public utilities, a bank, a cinema, a service station and a hotel; and the peripheral area containing the offices, warehouses, garages and bunk-houses of the various firms, and the railway station and airport.

The Knob Lake development has attracted a number of Indians who, as it was pointed out earlier, were basically discontented with the trapping existence. In June 1956 there were about 130 Montagnais, formerly from Seven Islands, living at Knob Lake; by mid-August 1956 the number had increased to almost 300, after the Indian Affairs Branch urged the 170 remaining Naskapi Indians to vacate the Chimo area in preference for Knob Lake. Almost all the firms in the area hired some Indians, despite the fact that they tended to fade away silently into the woods if caribou were reported or if the fishing was particularly good. In August more than seventy were employed, about one man per family. They now live on the shores of John Lake, two miles east of Schefferville, in a collection of wooden cabins and tents. This relocation of a significant number of Montagnais and Naskapi Indians constitutes one of the major secondary effects of the mineral development in the Labrador Trough. These people will enjoy a greater measure of opportunity and security than they have ever had before, through the advantages of education, medical supervision and employ-



About 300 Montagnais and Nas-kapi Indians have moved to the Knob Lake area in the hope of securing employment. They live about two miles from Schefferville in this settlement beside John Lake.

Right:—

The Roman Catholic church at Schefferville, built largely by the volunteer labour of the congregation, was completed in time for Christmas services in 1955. A smaller Protestant church is now under construction.

Below:—

A street in Schefferville, still lacking in landscaping. The houses, built by the Iron Ore Company of Canada, are rented by employees and may be purchased by them eventually.





At the Iron Ore Company of Canada's dock at Seven Islands a cargo vessel loads iron ore, while tugs stand by to assist her departure against an on-shore wind.

ment. This is especially true of the Naskapi, who were poor, primitive folk, untouched by education until now.

The population in the summer of 1956 reached a peak of 2,830 people, almost one-half being employees of the Iron Ore Company of Canada, and another one-quarter their families. The third largest group consisted of the employees of the firms working on construction in and around Schefferville, civilian air crews and R.C.A.F. personnel engaged in air supply of the Mid-Canada Defence Line sites stretching across the peninsula between the Labrador coast and Hudson Bay. The Indian population constituted ten per cent of the total. However, several fluctuations in this population should be mentioned, in order to demonstrate that the figure of 2,830 was valid only for the time of

the survey. First, there is the seasonal variation in the personnel of the Iron Ore Company of Canada; low winter temperatures prohibit the transport of ore to Seven Islands, and the labour force must be reduced. Second, there is uncertainty as to the permanence of the Indian settlement, and its size. Third, there has been the gradual withdrawal of men working on the Mid-Canada Defence Line as it has approached completion. There is also a withdrawal of construction firms as the housing project in Schefferville tapers off.

Although dusty streets, gaping excavations, and the gaunt frames of unfinished buildings were hardly conducive to an appreciation of its aesthetic qualities in the summer of 1956, there was evidence that Schefferville would one day be a very attractive town. While primary con-

NOB LAKE ON CANADA'S NEW FRONTIER

struction still assumed priority in the building program, it was heartening to observe the erection of traffic signs and the laying of sidewalks, and to know that landscaping would eventually do much to beautify the town.

Inevitably, one attempts to visualize the future. Knob Lake is a mining area, and present estimates of ore reserves indicate a potential annual production of about twenty million tons for several generations. When, however, one considers the possibility of other large deposits in the area, and the probable exploitation of lower grade ores, it seems apparent that the life of Knob Lake will be very much longer. It also seems likely that it will have a strategic importance for civil and military aviation as well; its location on the Mid-Canada Defence Line makes it a suitable centre for air defence of north-eastern Canada, and its climatic advantages have already suggested to some the possibility of its supplementing, or even conceivably replacing, Goose Bay as a stop-over on trans-Atlantic air routes.

The pioneer venture at Knob Lake has broken through the wall of climatic severity and inaccessibility to open up the long-ignored

interior of the peninsula. This has encouraged other industrial companies to come in. The British Newfoundland Company is building a road into Grand Falls, one of the largest potential sources of hydro-electric power in the world. Canadian Industries Limited are building a plant at Seven Islands. Canadian Javelin are working at Wabush Lake to extract low grade iron ore. The Cyrus Eaton associates are busy along the west coast of Ungava Bay, where a short ice-free season and some of the world's highest tides will be only two of the problems in the removal of iron ore. Interest is high in the nickel-rich Chukotat River belt of northern Ungava. Along the north shore of the St. Lawrence the lure of mineral resources is supplemented by the wealth of large forests, access to ocean shipping routes, and the advantages of abundant, inexpensive power. These are big attractions for industries such as pulp and paper, aluminum and chemicals. Today settlement is filling in behind an advancing frontier of industrial development, a twentieth century method of colonizing vacant lands. It can honestly be said that the "ice" of Labrador-Ungava has been broken.

The rapid growth of the port of Seven Islands in the last six years has changed its appearance greatly, but along the waterfront there is still evidence of the past and marine tradition.





One of the finest buildings in Guatemala City is this stately cathedral.

Guatemala— Pearl of Central America

by H. M. BERNEY¹

Photographs by the author.

THERE IS A SAYING in Guatemala that the rainbow takes its colours from that country. Any land which could give rise to such an expression must indeed possess a marvellous radiance. Our expedition is in full agreement, not only so far as the rainbow is concerned, but also in affirming that there is no country in Central America, nor indeed in the whole of Latin America, that can compare with it in richness of colouring and natural beauty.

Like all the countries of Central America, usually known as the "Banana Republics", Guatemala is small, about 42,044 square miles, or almost three times the size of Switzerland.² It is bordered on the south by El Salvador and Honduras, on the north by Mexico, and

on the east by British Honduras. Its southwestern margin is bounded by the Pacific Ocean, and on the east it just touches the Caribbean Sea.

The first thing that strikes one on entering Guatemalan territory is the wealth of natural beauty. Every type of vegetation is to be seen, from the deep jungle in the region of Petén to the majestic pines on the mountain sides. There are at least thirty-two volcanoes of which the highest is about 13,000 feet. In the low-lying regions there are fruits of every kind and also coffee plantations. A population of about three million is somewhat lost in this rich territory, which contains some entirely unexplored regions. Guatemala City, the capital, is a friendly place, clean, and well laid out,

¹The author is the leader of a three-year expedition by automobile through North, Central and South America. The group consists of five young people, four Swiss and one Italian. The article is based on a manuscript submitted in French.

²15,940 square miles.

with a population of about 300,000. In no other city of Latin America did we meet with so much courtesy and good manners on the part of motorists as we did in this capital. Traffic regulations are obeyed strictly and courteously, which is by no means the general rule in South America.

In the Guatemalan forests one of the most remarkable birds in all the world is to be found—the quetzal. Its plumage suggests spun gold set with emeralds and rubies. As it is well known that this bird cannot live in captivity, it has been chosen as the national emblem. The standard Guatemalan coin is known as a quetzal, and it is evidence of the sound financial position of the country that the quetzal is at parity with the United States dollar. This love of liberty does not manifest itself in a spirit of restrictive nationalism; on the contrary, the people are forthcoming and well-tempered, always ready to lend a hand, and to greet the tourist with a benevolent smile, often amused at the oddities of the stranger but never unfriendly. The tourist trade is fast becoming one of the principal sources of revenue, and the requirements are being met by magnificent hotels at all the strategic points, and the standards of cleanliness and good service are of the highest.

In addition to the natural beauty which lights up the whole land, this country possesses two assets which provide powerful attractions for visitors; the first is the aboriginal inhabitants, and the second is the archaeological interest of the remote past. The Guatemalan Indians can be distinguished at first glance from any others; their costumes are of a richness unequalled in the New World. Red is the predominant colour, but at festival-time all the colours of the rainbow are to be seen, harmonizing tastefully. The designs, usually symmetrical, show great inventiveness and an elegance of form that astonishes even the most widely travelled visitor. The villagers pride themselves on wearing a type of dress distinctive from those who dwell even a few miles away; the difference may be in the colour, the design, the form, or the quality of the material used, but it is a definite manifestation of fine artistic instinct. Nor is it only varied clothing that is produced by the deft hands of the weavers. Their skill extends over a wide range, and includes carpets, bags, and woven goods of all kinds. Indigenous art also finds expression in the form of pottery and silverware. When we visited these native workers in their homes, we were surprised at the perfection of orderliness and cleanliness

The native weavers of the village are here skilfully plying their trade.





One of the many splendid hotels on the shore of Lake Atitlan, built to meet the demands of many visitors to this romantic lake.

The "Capitanaria" of the ancient Spanish capital of Antigua.





The smiling village of San Antonio de Palopo nestles on the shores of Lake Atitlán, whose wonderful changing colours have earned for it the title of "the Pearl of Guatemala".

A native village, known as the port of San José, on the shores of the Pacific Ocean.





The native porters are capable of carrying immensely heavy loads. Here they are just arriving in the village of San Antonio de Palopo.

in all their dwellings. But then this little country never ceased to surprise us from the first day of our visit to the last. The people are very superstitious, and on their high feast days they will often practise the rites of the Roman Catholic religion strangely intermingled with ancient Mayan customs.

Every town and village has its market day once or twice a week, attended by gay crowds from all the surrounding neighbourhood. Very early in the morning or perhaps overnight one can watch these people, heavily laden with merchandise, pouring in to market from every side, with the wives and children following. These Indians have an unbelievable physical endurance; they can carry loads up to 150 pounds for incredible distances, and the women and children carry proportionately heavy burdens. One is not surprised, therefore, to find something of everything at the markets, which are usually held in front of the village church: vegetables, fruit, flowers, poultry, live animals, pottery, articles of furniture, kitchen-

ware, woven goods and clothing of every kind. Nearby is an open-air kitchen where one can purchase an attractive-looking plateful for the most trifling sum, and the dish is highly flavoured with mixed spices, not always to European taste.

As the country is very mountainous, the main thoroughfares have to be steeply graded, and driving along them amounts to a highly skilled sport. The government is gradually building excellent high roads better suited to the developing traffic requirements of the country. Every turning on the road offers some new and amazing view, each one seemingly more beautiful than the last. The lakes are like pearls in a setting of emeralds; they reflect the transient beauty of the changing skies, showing a world of dreamlike enchantment almost too perfect for a setting on this earth. One morning Lake Atitlán appeared in richest indigo fading to clear emerald, and the next day it had the iridescence of rich pearls. It is overshadowed with volcanoes and there

GUATEMALA—PEARL OF CENTRAL AMERICA

are tiny villages clustering around.

The Indians of Guatemala are the direct descendants of the Mayas, whose civilization was probably established between three and four thousand years before Christ, but the date is a subject of archaeological controversy. It spread from Mexico throughout Central America, and as Guatemala was the centre of this area, it offers the best field of scientific research into Mayan history. The ruins which have so far been brought to light prove that the Mayans were artists of exceptional talent, and that talent still lives among their present-day descendants. Astonishing discoveries have been made in regions hitherto unexplored, and one can glean from these sites a first-hand idea of the life of the ancient Maya Indians.

Guatemala can also give evidence of her more recent past, the traces of her colonization by the Spaniards in the sixteenth century.

Numerous public buildings, houses and especially churches provide valuable examples of the intricacies of Spanish art. It was in 1523-4 that the Indians were first attacked by the Spaniards and conquered after violent fighting. The ancient Spanish capital, Antigua, built at the foot of an active volcano, has an aura of romanticism that emanates from the ruins of its innumerable churches and monuments which bear witness to the many terrible earthquake shocks it has suffered.³ The present capital stands about forty miles nearer to safety.

This brief sketch can indicate but faintly how well Guatemala merits the abundant praises that have been showered on her, and it would take a large volume to pay her adequate tribute. This little country occupies a place of honour in the record of our journeys. We mean to go back there.

³See *The Unlucky City*, Canadian Geographical Journal, Vol. XVII, page 127.

A corner of the native market in Guatemala City. These markets play a very important part in the lives of the people; the variety of wares sold is amazing.





The practice of mountain climbing techniques is an important part of the curriculum of the mountain search and rescue school for national park wardens in the Flint Park area of Banff National Park, Alberta. Here two men demonstrate roped climbing on a static line.

John Porter



Training Park Wardens in the Rocky Mountains

by IRENE BAIRD

Photographs by Bruno Engler except where credited.

THE MOST rugged schools in Canada lie among the high peaks and mountain forests of Banff National Park. The men who attend them have to be as rugged. All are wardens from the seven national parks in the Rocky Mountains area — men chosen for mountain sense, keenness and stamina. To come out with a pass mark they have to be good.

The curriculum is threefold: mountain search and rescue, ski and winter rescue, and fire control. Most wardens who patrol the mountain parks the year round have to be proficient in

the techniques taught in all three schools and skilled in the use of climbing tools, rescue and fire-fighting apparatus, and other equipment. They must also be able to handle horses.

Warden training schools are not new to the National Parks Service of the Department of Northern Affairs and National Resources. It has been conducting them for years at different times and places. What is new is the enlarged scope of the programme — the decision to base all the schools at Camp Cuthead in the Flint Park area of Banff National Park and to hold

At top:—In difficult mountain terrain the lives of others often depend upon the skill and agility of park wardens. Teamwork is essential. Against a background of snow-capped peaks, a team studying winter rescue methods scales a steep mountain slope.



A study group. Left to right: park wardens M. Dawson, T. L. Ross (in charge of course) and instructor Hans Gmoser.

sessions three times a year. The type of instruction this programme is designed to provide ranges from basic training to advanced mountaineering.

The first Mountain Search and Rescue School of a regional character was held in Banff National Park in October 1955. The forty-two park wardens and four Royal Canadian Mounted Policemen who attended were representative of the group that met in February 1956 for two rugged weeks of winter rescue operations and again in late spring for an intensive refresher course in mountain fire patrol and tests of fire-fighting equipment.

The schools are organized by the Warden Service of Banff National Park under the direction of Chief Park Warden G. H. W. Ashley and Assistant Chief Park Warden Bert Pittaway. The latter, who acts as co-ordinator and supervises training, is aided by Assistant Chief Park Warden Walter Perren, a former Swiss mountain guide who brings to his adopted country a wealth of experience in advanced search and rescue work gained in the Alps. Co-operating with the Banff Warden Service are the chief and assistant chief park wardens of other mountain parks — Jasper,

Yoho, Glacier, Mount Revelstoke, Waterton Lakes and Kootenay.

Flint Mountain and the Flint Park area were chosen as permanent training headquarters because the terrain poses almost every problem a warden is likely to meet at the hand of nature or of man. Mountains are sheer, rock ledges narrow; snow is heavy and ice formations can be treacherous: fertile country for study by the class in avalanche danger recognition. The low-land mountain slopes, tangled with thick forest growth and scarred by old fire patches, provide ideal settings for practising fire control, preparing mountain pack-trains and setting up the emergency radio and telephone service used in fire fighting. The latter sends a warden up a tree in safety belt and climbing spurs, looking like a "high-rigger".

The variety of situations a warden must be competent to deal with in the Rocky Mountains national parks would amaze the casual visitor not given to pondering what goes into the training of the man in the olive green uniform with the yellow "park warden" flashes on his sleeve.

Wardens work as a team but throughout the vast and sprawling domain of the mountain parks (8,639 square miles) warden posts may be far apart and the man on the spot must be equally qualified to handle an emergency call from a stranded climbing party, a rash of lightning-set forest fires, a temperamental bear or a balky truck.

Mountain weather, as vital a factor in search and rescue as it is in climbing and skiing, is unpredictable. By instinct as much as training, a park warden must know how to read his mountains day and night by map, compass, cloud and the "feel" of the weather.

His trained eye must recognize advance signs of avalanche danger and accurately appraise the strength of snow, ice or rock formations. If a snow cornice has built up beyond safety, he must know how to set a charge to blast it out, bringing down tons of snow to eliminate a climbing hazard. For winter search and rescue, he must be sure-footed on skis and snow-shoes. In summer he may have to direct a team that is lowering a casualty, lashed in a mine rescue-

Inching his way along, face down, Assistant Chief Park Warden Bert Pittaway demonstrates chasm-crossing on a static line.

basket, down a sheer rock face. And in all situations he must be prepared to do his best alone.

Few park wardens would admit having more than a routine job. They are modest, not too articulate men. Yet some of the tests they must pass to complete the three training programmes verge on the spectacular.

When fighting forest fires, a fire crew may be barred by a 400-foot-deep chasm. This may call for chasm-crossing on a static line — inching from bank to bank, face down, on a single strand of tough nylon rope. Cliff-hanging is another skill that leaves no margin for error. An exercise, at Mountain Search and Rescue School, re-enacted the rescue of an injured climber down the sheer face of Flint Mountain, a thousand feet above Cascade River. To carry out operations like this in such terrain a warden must "know his ropes".

Each school session closes with a written examination covering every aspect of field training and the types of equipment used. In the case of the Ski and Winter Rescue School, for example, the work to be reviewed includes instruction in cross-country skiing, ski patrolling, first aid (first aid is mandatory in park warden training), use of ski bindings, ski waxing, emergency ski-binding repairs, snow-shoeing, and handling rescue toboggans. Ward-



ens also have to show that they can organize and lead a ski patrol.

Canada's western parks offer some of the most superb mountaineering country in the world, whether a climber seeks challenge or landscape. It is the aim of the National Parks Service to keep them as safe as a good park warden service and a co-operative public can make them.

Park regulations concerning safety are explicit. They require that any person or persons planning to climb a mountain or camp out overnight register at park headquarters or with a park warden before setting out. Date, route and proposed duration of stay must be specified. This applies whether travelling with a guide or without one. Most of those who vacation in the parks willingly comply. But there are exceptions — a few who feel that their mountaineering skill sets them above the rules. There is also the occasional lone wolf who simply goes off, telling nobody, and the careless camper or climber who meant to register but forgot. For the safety of these, as well as that of the law-complying majority, park wardens must be ever on the alert.

The calibre of national parks wardens is high. It has to be. The aim of the schools is to equip them with the best mountain training available. The most experienced man cannot know his job too well.

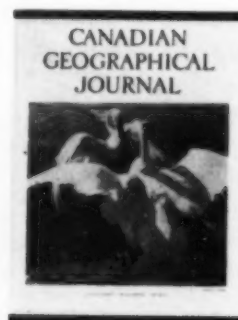
An "accident victim" is lowered over the side of a precipitous cliff in a mine rescue-basket.



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EDITOR'S NOTE-BOOK

B. J. McGuire (*Water Power in Quebec*) is an experienced writer who has prepared a number of major articles on natural resources and industry for the Journal. As partner in a public relations firm in Montreal, he has followed developments in the Province of Quebec closely. He received his Bachelor of Arts degree from the University of Toronto and afterward pursued graduate studies there.

* * *

W. Gillies Ross (*Knob Lake On Canada's New Frontier*), after graduation from Royal Military College at Kingston in 1953, spent two years travelling in Europe and the West Indies. He had the unusual experience of crossing the Atlantic from the Mediterranean to the American Virgin Islands in a 93-foot ketch. He is now in his last year at McGill University, where he is majoring in geography. The article is based upon his observations last summer at the McGill Subarctic Research Station in the Knob Lake area.

* * *

H. M. Berney (*Guatemala — Pearl of Central America*) is the Swiss leader of a well-equipped group that has spent three years touring the Americas by automobile. Among the notable automobile expeditions he has made in the past are one from the Mediterranean to Cape Town, one from Switzerland to Singapore, and one from Calcutta to Paris.

* * *

Irene Baird (*Training Park Wardens in the Rocky Mountains*) is a freelance writer and the author of three novels. Since 1942 she has been a federal government employee. She now serves as an information officer in the Department of Northern Affairs and National Resources.



THE TRAVEL CORNER



The Mayflower II, which will be on display in New York's harbour for the next few months.

Cayton-Klempner

Mayflower II Exposition

Those planning to visit New York during the next six months will have an opportunity of seeing the *Mayflower II*, which sailed from England to the United States this spring. The ship, a carefully constructed replica of the original seventeenth century *Mayflower*, has been presented to the American people by the English as a goodwill gesture. It is to be moored at the Hudson River Day Line pier on West 41st Street, which for the summer has been transformed into a log-constructed "Pilgrim Village" containing displays of British goods and a Mayflower Museum. *Memorabilia* of the days of the Pilgrim Fathers, assembled from collections in England and the United States, are exhibited in the museum. The admission fee (ninety cents for adults and forty cents for children) entitles visitors to board the ship and examine the village and its displays. Eventually the *Mayflower II* will become part of a permanent exhibition at Plymouth, Massachusetts.

Austrian Summer Camps and Tours

Students visiting Austria may wish to take advantage of the economical

charges for food and meals at a number of Austrian summer youth camps. These do not fall into the luxury class, but they are by no means second rate. In most youth camps there are several beds to a room. The charges generally range between about \$1.25 and \$1.50 a day for sleeping accommodation and three or four meals. There are camps at the following locations: Forchtenstein Castle, near Neumarkt, Styria; Gmunden on Traunsee in Upper Austria's lake country; Schlicker High Valley in the Tyrol; Bad Woerschach in Styria; Wagrain, Salzburg; and Muehlbach, Salzburg. Various tours and excursions are also offered at modest rates for students and young people. Further information may be obtained from the Cultural Affairs Branch of the Austrian Consulate General, 31 East 69th Street, New York.

Hollywood's Pilgrimage Play

On 29 July the Pilgrimage Play will commence its twenty-seventh season in the Pilgrimage Theatre in the Hollywood Hills of Southern California. The play, presented every night except Monday for four or five weeks, deals with the life of Christ. A cast of ninety actors and actresses takes part in it.

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Tours of the Gaspé Peninsula

Four-day tours of the picturesque Gaspé Peninsula of Quebec are offered by Canadian National Railways this summer. Rates include transportation, meals, hotel accommodation and side excursions. The first part of the tour — as far as Mont Joli — is by trains of Canadian National's main trans-continental line. From there travellers are taken on a leisurely motor trip of 550 miles around the peninsula, stopping at various villages, including Cap Chat, Rivière Madeleine, Perce and Matapédia. There is also a boat trip to Bonaventure Island, the sea bird sanctuary.

American Banner Lines

American Banner Lines, a new United States steamship company financed by clients of the American Securities Corporation, has announced that a tourist-class trans-Atlantic liner will be placed in service next March from New York to Zeebrugge, Belgium, and Amsterdam, Holland. The 20,000-ton ship, a converted and refitted mariner class vessel, will operate on a year-round schedule and will take seven days to cross the Atlantic. She will carry 860 tourist class passengers in staterooms with private bathrooms and showers, and forty passengers in first class accommodation. A non-stop boat-train, running from Zeebrugge to Paris in three hours and fifteen minutes, will begin operating at the time the ship makes her maiden voyage. The company plans to place two more vessels in the trans-Atlantic service in the next five years.

Fin, Fur and Feather Club Tour

Trans-Canada Air Lines offers a hunting and fishing excursion to Northern Ontario which it calls the "Fin, Fur and Feather Club Tour". The airline flies sportsmen as far as Sudbury, Ontario. From there they travel by limousine, train or chartered aircraft another thirty to sixty miles to any one of seven fish and game lodges. A tour of this kind, lasting three days and two nights, may be taken for as little as \$48.40 with all expenses included, except air fare.

Jamestown, Virginia, Anniversary

It is expected that hundreds of tourists will visit Jamestown, Virginia, this summer. The 350th anniversary of the founding of the village is being celebrated. Once capital of the state, the village had fallen into

ruins. Millions of dollars have been spent to restore it in authentic detail. Replicas of the *Discovery*, *Susan Constant* and *Godspeed*, the ships that carried the original early seventeenth century settlers, are on display. Jamestown is in Colonial National Historical Park, not far from Williamsburg, the present state capital. It was the first permanent English settlement in the United States.

Travel Guide to Britain

Grayson Services (Canada) Limited have issued a new handbook for those going to Britain, which stresses ways of economizing when travelling there. It contains sections under the following headings: packing suggestions, money and exchange, customs regulations, travelling in Britain, accommodation, dining and drinking, shopping hints, what to see, amusements, thrift tips, how to tip, and so on. The booklet, which is small enough to fit easily into a hand-bag or pocket, costs fifty cents. Copies may be obtained from Grayson Services (Canada) Limited, 77 Adelaide Street West, Toronto.

Theatre of Nations in Paris

At the request of the International Theatre Institute, a "Theatre of Nations" has been established in Paris. It is to present an annual festival of dramatic, operatic and choreographic productions from all over the world. The famous Sarah Bernhardt theatre is being used for the purpose. Its present season extends to 30 July.

Caronia September Cruise

In September the Cunard Steamship Company's *Caronia* will make two cruises of the Caribbean. The first, starting 6 September, will last thirteen days; the second, commencing 21 September, will be a fifteen-day cruise. Among the ports of call are Martinique, Trinidad, La Guaira, Curaçao, Port-au-Prince, Nassau, St. Thomas and Havana. Rates start at \$345 for the first cruise and at \$375 for the second.

Empress of England

This spring Canadian Pacific Steamship Company's new ocean liner, *Empress of England*, made her maiden voyage from Great Britain to Canada. With this ship in service, there are now four "White Empresses" sailing the North Atlantic. The others are the *Empress of Britain*, *Empress of France* and *Empress of Scotland*.

In architectural design the new vessel is very similar to the *Empress*

of Britain, which entered service last year; but its décor has a markedly English flavour in keeping with its name. It is a 25,500-ton ship and cruises at a speed of about twenty-one knots. One of its unusual features is a telephone service that permits passengers to call any land phone in the world. It also has a swimming pool, theatre, ballroom and concert hall, library, playrooms for children, writing rooms, smoking rooms and cocktail bars.

AMONGST THE NEW BOOKS

The Geography, Birds, and Mammals of the Perry River Region

by Harold C. Hanson, Paul Queneau, and Peter Scott

(The Arctic Institute of North America, Montreal. \$2.00)

Angus Gavin's discovery of the breeding grounds of the rare Ross's Goose in the remote barrens of the Perry River region, Northwest Territories, and his account of a relatively rich bird and mammal fauna there, fired the enthusiasm of three young scientists to carry out an expedition to that unexplored part of the Canadian Arctic mainland. Support secured from many sources, particularly the Arctic Institute, enabled them to spend the period 6 June to 2 August, 1949 gathering data and specimens there. This report comprises the scientific results of their expedition.

The account of the geography of the quadrangle formed by Ellice River, MacAlpine Lake, Simpson River and Queen Maud Gulf is by Queneau. It contains information on the cartography, physical geology, summer weather, ice and snow conditions, the Eskimo, transportation problems, and vegetation. The Perry River was found to flow almost due north instead of north-west as shown on previous maps. Its mouth is some fifteen miles farther west than was shown, placing it in Mackenzie instead of Keewatin. It was found to drain from the east side of MacAlpine Lake instead of the west side.

Forty-seven species and subspecies of birds were observed. Data on the waterfowl are particularly full, with information on local distribution and relative abundance, nesting habits, productivity, food, behaviour, weights, plumages, and parasites. Taxonomic comments are based on specimens collected by the expedition. No previous scientific study of Ross's Goose on its nesting grounds had been made, and Hanson and Scott took full advantage of this opportunity with the result that the report contains ten pages of data on this rare bird.

(Continued on page XII)



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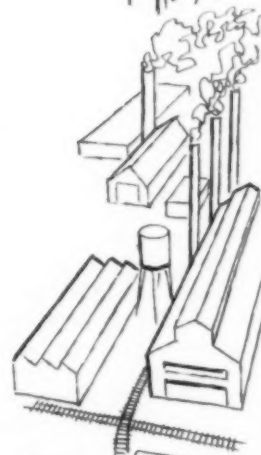
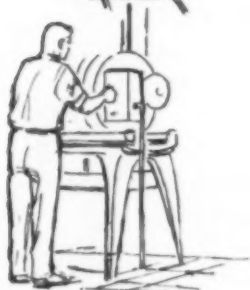
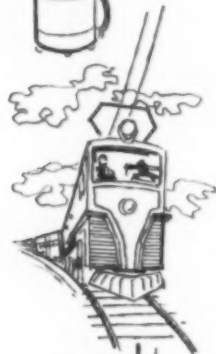
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The power resources of Gatineau Power Company were increased during 1956 by the installation of a 47,000 h.p. hydro-electric generating unit at Paugan Falls and the purchase of 25,000 h.p. from Maclaren-Quebec Power Company. The total power resources of the Company, including purchased power, amount to 859,094 h.p. The total generated and purchased energy for the year was 3,664,290,460 kilowatt hours compared to 3,464,479,710 kilowatt hours in 1955, an increase of 199,810,750 kilowatt hours.

During the post-war period Gatineau Power Company expended over Twenty Million Dollars in additions and improvements to its facilities for generation and distribution of electric service throughout the Laurentians and Western Quebec.

Work is proceeding on the changeover from 25 to 60 cycle apparatus at Paugan, Chelsea and Farmers plants, under arrangements with and at the expense of The Hydro-Electric Power Commission of Ontario.

Some minor adjustments were made in the retail rate schedules during the second quarter of 1956, pursuant to an Order of the Provincial Electricity Board, but the rates charged by the Company still continue, in most cases, to be lower than those charged by other Quebec utilities, where rates are generally much lower than in any other similar situation on this Continent.

While current credit restriction policies may slow down the impressive increase in the demand for electric service, there is every indication that over the years there will continue to be a sustained growth both in demand and in the uses of electricity in the area served by the Company.

GATINEAU POWER COMPANY

HULL, P.Q., CANADA

(Continued from page X)

Study of the mammals was secondary to investigations of the bird life. There is, however, information on the Barren Ground Hare, Parry's Ground Squirrel, Brown Lemming, Varying Lemming, Red-backed Mouse, and Barren Ground Caribou. A short appendix contains brief comments on specimens of rocks, fishes, and insects.

The report is adequately illustrated, superbly edited, and well printed on good paper. It is a substantial contribution to our knowledge of the least explored part of the Canadian mainland.

W. EARL GODFREY

Mr. Earl Godfrey is Curator of Ornithology at the National Museum of Canada.

* * *

Canada's Century

(Revised Edition)

by D. M. LeBourdais

(McClelland & Stewart Limited, Toronto. \$5.00)

This book is a revised edition of one which was published originally in 1951. The main purpose of this revision is to bring the material discussed up to date in the light of events of the last five years. Particular attention is given to development that has taken place in Northern Canada. These events become all the more impressive when viewed collectively through Mr. LeBourdais's energetic presentation.

There is no doubt that in this age of a rapidly expanding economy there is need for the major developments to be placed in perspective. In order that Canadians may know their own country and that others may know Canada as it really is, the information available must be kept as up to date as possible. It is indeed difficult to keep abreast of Canadian expansion. Since this book was published earlier this year, events of significance for Canada such as the extension of the Pacific Great Eastern Railway from Squamish to Vancouver have become realities.

The author points out that Canada is changing from the nation of a few years back when it was a thin line of settlement north of the American border to a nation occupying its territory in depth. This move to the north will have important effects on Canadian outlook. Canadians have always tended to think of Prince George, Edmonton and The Pas as being in the north, yet each of them lies within the southern half of their respective provinces.

Mr. LeBourdais's main theme is that Canada has the natural resources

(Continued on page XIII)

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(Continued from page XII)

of a great nation. It is only recently that the extent of these resources has begun to be realized. At present Canada has too small a population to develop the full potential of its resources. More people and a truly Canadian outlook are necessary if it is to realize its opportunities to become a great nation.

There is no doubt that much has been accomplished and that much remains to be done. Whether the future will be as the author predicts, only time will tell. One could differ with him on certain details of future events; it would be difficult to deny that there will be great changes.

Here, then, is Canada as it is today. Probably one of the great periods in our history is occurring as part of our day-to-day lives. When events of such great importance happen so close, it is easy to overlook their true significance. In this book the essentials of new developments are brought into focus and their probable implications for the future are appraised.

The book is well illustrated with photographs. A map of Canada appears as an end-paper. A few more maps in the body of the book would have added to an already fine presentation. This book can be recommended to all Canadians and all who are interested in Canada.

GORDON D. TAYLOR

Mr. Gordon Taylor is a geographer in the Parks and Recreation Division of the British Columbia Forest Service.

XIII

The Malta Directory and Trade Index, 1956

by the Malta Publicity Services, Limited

(George Bonavia, the Malta News, Windsor, Ontario. \$3.50)

The official title belies the real charm, but accurately suggests the real usefulness of this book: for this attempt by the Malta Publicity Services to compile the first trade index, year book, and tourist guide has been delightfully and usefully effective. The business man and trader will find useful appraisals of the Maltese economy and commerce, also information on the Malta Chamber of Commerce, the Federation of Malta Industries, the general Retailers Union, the Malta Trade Fair Corporation and many other organizations and subjects of vital interest. Each short article is candid and comprehensive. Most useful also is an extensive list of business organizations of all sorts on the island, a list of Maltese cable addresses and trade marks and brand names. There is a copy of the tariff and the postal regulations.

The tourist, even the "arm-chair" tourist, will find fascinating accounts of the origin of Maltese cooking and the many feasts and carnivals which occur on the island. For those planning a visit there is well-organized information on transportation, communication, and accommodation. For all there is a wealth of vividly but simply written background material on all aspects of the island, historic, linguistic, medical, legal, constitutional and so on. Throughout the book one finds such articles as "British Regiments in Malta", "The Wine Industry", "The Weaving Industry", "Welcome to Malta", "Folk Festival of Malta" and "The Royal Library of Malta".

The publishers are to be congratulated on so fine a first effort. In the book they ask for suggestions. It might be well to use a few more photo-

graphs and, if possible, coloured ones next time. Any one who is in any way concerned with Malta either through business or travel interests will be well repaid in enjoyment and information for any time spent with *The Malta Directory and Trade Index, 1956*.

DAVID HUMMEL

Mr. David Hummel is an assistant in the Trade Commissioner Service of the Government of Canada.

* * *

Antarctica in the International Geophysical Year

Publication 462 of the National Academy of Sciences (U.S.A.)

(Washington, D.C. \$2.00)

This book is based on an Antarctic Symposium held in Washington in April 1956 under the auspices of the American Geophysical Union. It aims at bringing together the salient points of present knowledge in a variety of scientific fields to provide a background for I.G.Y. research workers. Most of the papers are up-to-date and authoritative, a great improvement on the only comparable monograph of recent years, the New Zealand Antarctic Society's *The Antarctic Today* (1952). The editors are to be congratulated on a generally successful struggle against the parochialism which so often characterizes American writings on Antarctica. Here we have a book, written by Americans for Americans, which nevertheless deserves to be read by scientists from all eleven nations taking part in I.G.Y. Antarctic activities. For Canadians, it is far the best collection of papers in its field. The following subjects are covered: geography, photogeography, glaciology, climatology and meteorology, stratigraphy and structure, petrology, submarine geology, geomagnetism, ionosphere, aurora, cosmic rays, fauna and flora. There is a fold-



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ing map on a scale of 1:6,000,000. It is the most detailed single-sheet map ever produced. But the liberal peppering of place-names over areas in which man has never set foot gives a false impression of accuracy; actually a great deal is plotted from air photographs with no ground control whatever. We can only hope that the baffled explorer may find consolation in the knowledge that if a mountain is not where the map shows it, it is certainly somewhere to be found, for the cartographer has a photograph of it. There are more compilation mistakes than there should be; the explanation appears to be that the map was produced in a hurry. Under its title is written: "All names checked by the United States Board on Geographic Names except those marked with an asterisk". Either there are too few asterisks or the Board is getting careless, for there are mistakes in the transliteration of foreign names. It would be worth checking them against the original surveys before attempting to copy any part of the map. The book employs the latest concise but unliterary American usage in referring to an *air support facility* when it means a small air base. Dr. Paul Siple pauses to wonder if there is not such a thing as over-mechanization in Antarctic research. Of "Operation Deepfreeze I" he writes: "The automation was so complete that the Navy dispatched pilots and technicians rather than trained geographers to explore the interior of Antarctica." How right he is to wonder! Dr. Robert Sharp in a paper which in his own words represents "the indoor musings of one who has never been to the Antarctic" contributes a valuable summary of the objectives of glaciological research. But he is not as up-to-date as he should be, having missed the work of Liljequist (Proc. Toronto Met. Conf. 1953) and the revised seismic ice depth measurements of Robin (Union Géod. et Géophys. Int., Rome 1954). He misquotes Schytt on page 31 and again on page 34, and miscalculates the amount of deflation on page 32. These small points serve to remind us that no book of this size can absolve the specialist from his duty of making a thorough search of the literature of his subject before setting out to contribute to it, but it can and in this case does allow him a very valuable excursion into the fields of other specialists.

CHARLES SWITHINBANK

Dr. Charles Swithinbank is on a research fellowship of the Scott Polar Research Institute of Cambridge on loan to the Defence Research Board of the Canadian Government.



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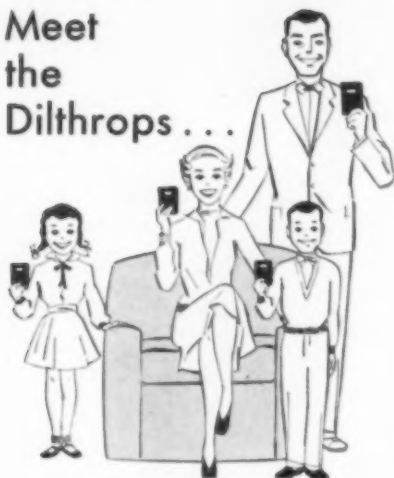
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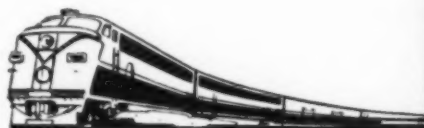
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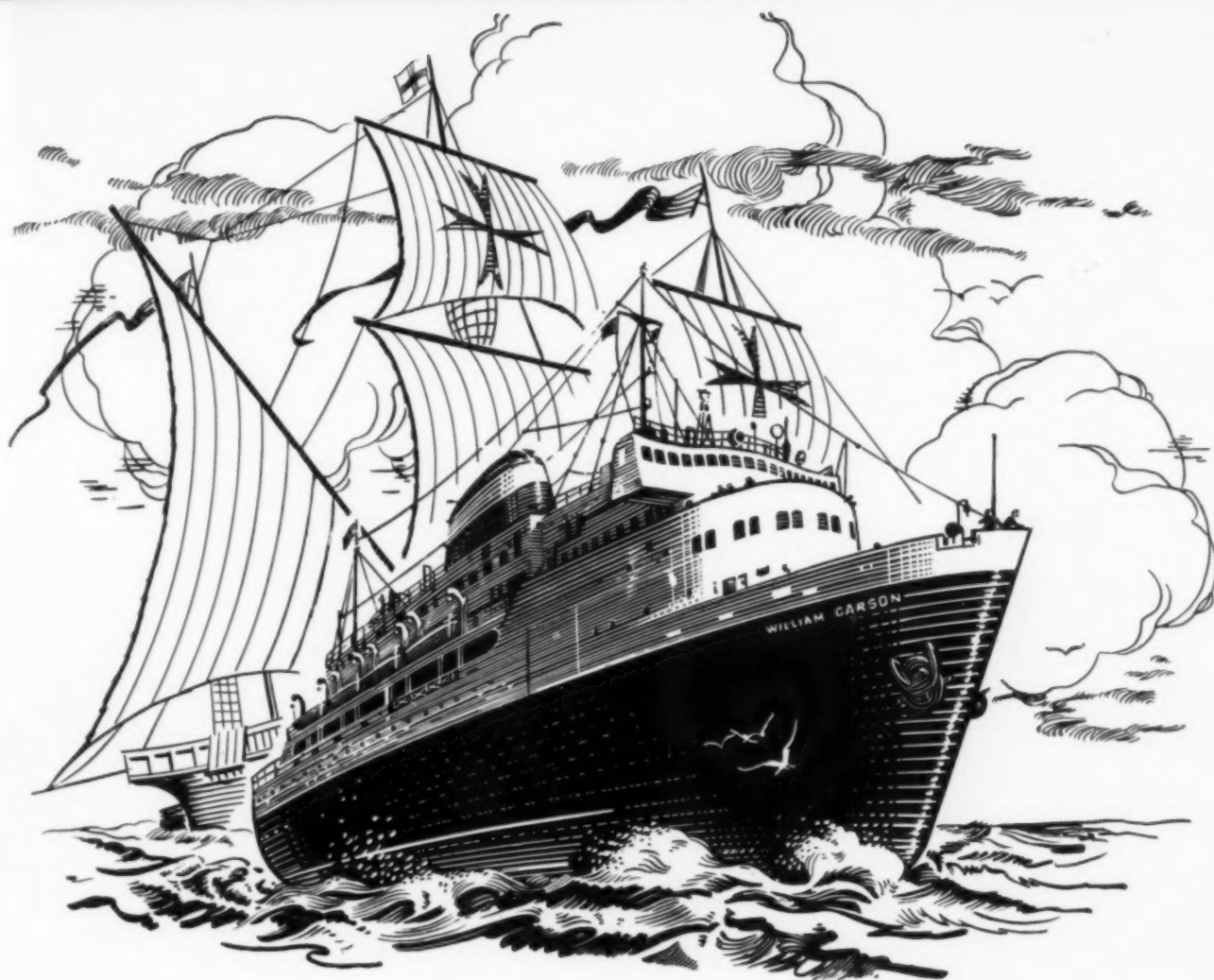
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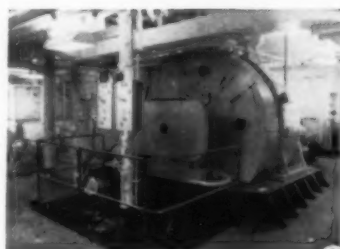
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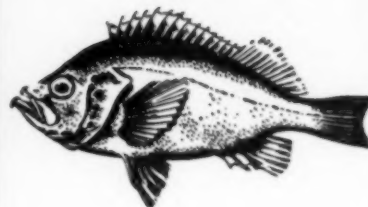
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THE ROSEFISH is found in abundance off Canada's east coast. The Department of Fisheries reports that exploratory fishing by the Fisheries Research Board of Canada indicates still greater stocks to the north.



A rose is a bream is a perch—

THE ROSEFISH, variously called Red Bream and Ocean Perch, was, until recent years, of little or no commercial or food value. Turning point in its importance came with advancements in fish freezing and handling. The rosefish were automatically scaled and filleted, then quick frozen and sent to market as Ocean Perch. Their mild flavour and relatively low price won them instant popularity.

At the same time the growth of *otter trawling* with huge, open-mouthed nets made the catching of rosefish in large quantities a commercial possibility.

The Fisheries Research Board of Canada, the Department's scientific arm, has discovered many of the important grounds which are being fished today and others still untapped. The rosefish typifies the role—one of many—that the Department plays in developing Canada's vast and valuable fish resources.



Virtually all the rosefish catch is filleted and quick frozen. The by-products are made into high-vitamin-content meal and oil.

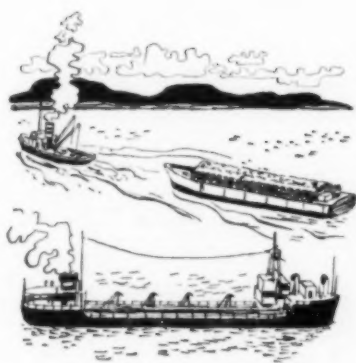
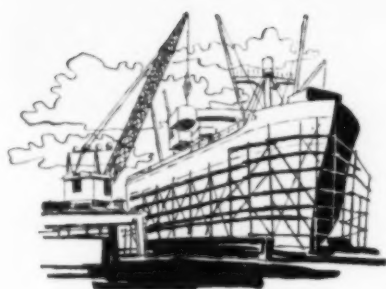


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DEPARTMENT OF FISHERIES
OTTAWA CANADA

HON. JAMES SINCLAIR, M.P., MINISTER

GEORGE R. CLARK, DEPUTY MINISTER



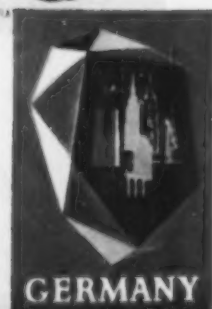
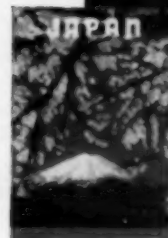
THE CHALLENGE OF PROGRESS

Canada's progress of recent years offers an irresistible challenge. Her stepped-up industrial program, her ever-expanding mining and oil interests, the St. Lawrence Seaway & Power Project, are just some of the signs of Canada's growth.

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